

A REVISION OF THE GENERA
MELANOLOPHIA, *PHEROTESIA*,
AND *MELANOTESIA* (LEPI-
DOPTERA, GEOMETRIDAE)

FREDERICK H. RINDGE

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(LEPIDOPTERA, GEOMETRIDAE)

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INTRODUCTION

A NUMBER OF YEARS AGO the author made dissections of the genitalia of the five North American species of *Melanolophia*. Later he began the dissection of the tropical species of this group, in order to try to find the relationships between the two, previously uncorrelated, faunas. This study turned out to be a fascinating one, as the genitalia, particularly of the males, are usually very distinct specifically, although the adults may be almost identical in maculation, color, and size. The genitalia of the tropical species had never been examined before, and a number of interesting discoveries were made. This preliminary work indicated a great need for a revisionary study of the group; the present paper is the result. I have attempted to re-evaluate this group of moths, together with two closely related genera, to answer some of the questions pertaining to their phylogeny, distribution, and taxonomy, and to propose a more satisfactory systematic arrangement of the species.

The species covered in this paper are divided into three closely allied and highly evolved genera of the Ennominae, namely, *Melanolophia*, *Pherotesia*, and *Melanotesia*. McDunnough (1920b) placed *Melanolophia* in the Cleorini. Forbes (1948) subdivided this large group into two closely allied tribes, using the terms "Boarmiini" and "Melanolophiini," with *Melanolophia* and *Pherotesia* being placed in the latter. The latter tribe is rather doubtfully distinct, as Forbes himself admits. A greater knowledge of the anatomy of the moths, particularly those from Central and South America, is needed before the problem of the tribal names can be decided.

The species of *Melanolophia* are found from southern Alaska and southern Canada through Central America to southern South America, and thus range from about latitude 56° N. to approximately latitude 40° S. The members of the other two genera are not so widespread; *Pherotesia* occurs from Mexico to Bolivia and Brazil, whereas *Melanotesia* is known from Colombia, Peru, and Bolivia. Adequate material, except for three of the North American species, is not available at this time for the large number of subtropical

and tropical species. Much more collecting is needed, so that we can obtain adequate study material and acquire a more thorough idea of the distribution and variation of the different species.

MATERIALS AND METHODS

MATERIALS STUDIED

This revision is based primarily on a study of the specimens in the collections of the American Museum of Natural History, the British Museum (Natural History), and the United States National Museum of the Smithsonian Institution. Material from the collection of the Los Angeles County Museum and of the private collections of several individuals has also been examined; these are referred to specifically in the section on Acknowledgments. All the type specimens in this country have been studied by the author. The large number of types in the British Museum (Natural History) have not been personally examined but, through the generous cooperation of Mr. D. S. Fletcher, the genitalia of those types have been dissected, studied, and compared.

All the specimens studied by the author at the American Museum of Natural History during the preparation of this paper have had identification or type labels affixed. All too often such labeling has not been done in the past, so that there is always the question of whether or not certain specimens were examined by a reviser.

The specimens photographed for this revision bear a typewritten "photo" level. In general, the adults and genitalia that are figured have been taken from the collection of the American Museum of Natural History. When such a procedure was not practical, the fact is specifically noted. The following abbreviations have been used:

- A.M.N.H., the American Museum of Natural History
- C.N.C., Canadian National Collection, Ottawa, Ontario, Canada
- B.M.N.H., British Museum (Natural History), London
- U.S.N.M., United States National Museum, Smithsonian Institution, Washington, D. C.

A total of 2988 specimens were studied. A large number of genitalic slides were prepared by the author, who also had at his disposal the slides made by J. H. Sperry at the American Museum of Natural History, by H. W. Capps and E. L. Todd of the United States National Museum, and by D. S. Fletcher of the British Museum (Natural History). In all, 771 genitalic slides were examined.

DESCRIPTIONS

A binocular dissecting microscope was used throughout when descriptions of the adults and genitalia were written. The same basic pattern of descriptions is followed throughout this paper for all generic and specific descriptions. All species are characterized by a detailed description of the adult male, with comparative notes on the female, and descriptions of the genitalia of both sexes are given, when both are known.

GENITALIC FIGURES

All the male genitalia were drawn to the same scale and have received a uniform reduction. The drawings of the female structures were done with two different scales, as the figures of the sterigma and ductus bursae were done on a larger scale than were the drawings that include the corpus bursae. These two sets of figures each have received a uniform reduction.

Some caution must be taken in the use of these figures as the appearance of certain parts may vary depending upon the degree to which the preparations were flattened or the angle at which they were drawn. The author attempted to overcome such discrepancies by making several dissections to obtain comparable mounts, but this was sometimes impossible because of insufficient material.

LOCALITY DATA

The locality data are briefly summarized under the heading of Range for every species. This information for four of the species found in North America, north of Mexico, is presented on maps as well. For the remainder, the locality data are presented in the Appendix for the previously described species and, for the new species and subspecies, in the list of type material for that taxon in the text.

A similar presentation is given in both the text and Appendix, as the data are grouped by countries. The data of capture, the elevation, and the collector, whenever these are specified, are given. To help keep these data as brief as possible, only the months of capture are given in the Appendix.

Unfortunately many of the labels did not include all this valuable information and, in many cases, had very few data. The index to the Map of Hispanic America of the American Geographical Society (1945) served as the main source of information in the obtaining of additional facts. Wherever possible, the department, state, or province is given for the larger countries; if not indicated on the label, it is inserted in brackets in the text and Appendix. This task was lightened immeasurably for Ecuadorian localities by Brown's publication (1941) on the collecting localities of that country.

As far as possible the distributional data for each species have been correlated with the climatic zones of South America and, to a lesser extent, Central America. The source of terms for these zones is the "Life pictorial atlas of the world" (Time, Inc., 1961).

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HISTORICAL BACKGROUND

Hulst proposed *Melanolophia* in 1896, with *canadaria* Guenée as the only included species. In 1920 McDunnough recognized the five species that properly belong to the North American fauna. Virtually all the species in this genus from Mexico, Central America, and South America were described in *Boarmia*, *Cymatophora*, or *Tephrosia*. Prout was the first to recognize that *Melanolophia* was applicable to the neotropical fauna; he called attention to this fact in a short note in 1910 (1910a). In fact, only five species from tropical America were correctly described in *Melanolophia*.

Pherotesia was proposed by Schaus in 1901 (1901b) for *malinaria*. This genus was recognized by the workers on tropical geometrids, as six of the 11 included species were placed in it. The other species were described in *Boarmia*, *Melanolophia*, *Pterocypha*, and *Tephrosia*.

With the exception of McDunnough's paper (1920b), mentioned above, and a brief treatment by Forbes (1948), nothing has been done on a generic or revisionary basis with either of these two genera. It is virtually impossible to work from the literature on the neotropical species, because the generic placement of so many of the species is incorrect. The present paper is the first attempt to revise these two genera.

On the specific level, for the species included in this paper, Guenée (1857) was the earliest to describe some of the taxa; he

named three species. Shortly thereafter Walker (1860, 1861) named three species. During the next 30 years there were only two descriptions, one by Snellen (1874) and the other by Maassen (1890).

During the next several years, the majority of the descriptions appeared. These were by Druce (1892; one), Dognin (1893–1916; 10), W. Warren (1897–1909; 22), Schaus (1897–1927; nine); Dyar (1904–1926; three) and Prout (1910–1933; five). McDunnough added two more names between 1920 and 1940, and Cassino and Swett one. Of the above totals, 13 names have been placed in the synonymy.

In this revision 112 specific and subspecific names are recognized; 59 of them are proposed as new.

PHYLOGENY

CHARACTERS

Of the three genera, *Melanolophia* is considered to be the most primitive. Some of the more primitive characters include small size and unicolorous wings with relatively straight cross lines; in the males, weakly represented hair pencils on A_3 (perhaps deciduous in some species); in the male genitalia, a simple uncus, a relatively small, bifurcate gnathos, and a small subrectangular anellus; and, in the female genitalia, a small, often membranous sterigma, a convoluted, lip-like lamella antevaginalis, a small sclerotized area representing the lamella postvaginalis, and a relatively long ductus bursae.

From these the progressively larger species developed with different types of maculation and color. The cross lines in the more advanced species vary from being straight to being curved or dentate, and their position on the wings varies within relatively small limits. The color of the upper surface of the wings is some shade of brown or grayish brown in *Melanolophia*, and it is quite often consistent within a species group.

In the males the abdominal hair pencils become progressively larger and stronger, as the species become more highly evolved, culminating in hair pencils that have become fused together to form a curved, sclerotized process on each side of the abdomen. In the genitalia, the lines of specialization are from a simple uncus to one that is variously swol-

len or capitate. The gnathos shows a great variety of forms, becoming larger, rounded, trilobed, or even asymmetrical. The anellus varies from weakly to strongly constricted medially, and the posterior portion is variously shaped. The armature of the valves is exceedingly variable, so much so, in fact, that, while offering excellent specific characteristics, little can be stated about evolutionary trends.

In the female genitalia the sterigma tends to become larger and more sclerotized, and many species have a large number of small concentric ridges that make up this structure. The lamella antevaginalis and the lamella postvaginalis become elongate, sclerotized processes in a number of species. In the more highly evolved taxa the ductus bursae becomes very short.

In *Pherotesia* there are two main divisions, based primarily on the branching of the medial vein of the secondaries in the male, and each has a distinctive type of maculation. This genus has more highly specialized characters than are found in *Melanolophia*, and they are represented by the above-mentioned branching of M_2 and M_3 , plus the appearance in the males, on the under side of the hind wings on vein Cu_2 , of a raised scent patch that is present in about one-half of the species. In the male genitalia of each species there are a relatively simple uncus and gnathos, the ornamentation of the valves is symmetrical, the anellus of certain species is variously modified, and the vesica is usually armed. In the female genitalia, the more advanced characters include lateral sclerotized plates in the sterigma in some species, these becoming reduced and lost in the more highly evolved taxa, the lack of lamellae antevaginalis and postvaginalis, a moderate, short, or very short ductus bursae, which becomes highly sclerotized, the sclerotization of part of the corpus bursae in some taxa, and the loss of the signum.

Melanotesia is more highly evolved than *Pherotesia*. This genus has specialized venation in the forewings, in that R_1 is free from R_2 , and the pectinations of the antennae of the males are reduced, being shorter and not extending so far along the shaft as in the previous genera. The genitalia are basically similar to those of *Pherotesia*. The male struc-

tures have a raised process on the face of the valve beyond the middle, and a very strongly developed, bilobate, and setose anellus; the female genitalia have a signum.

DISTRIBUTION

The most primitive species of *Melanolophia* are found in the Humid Subtropical Zone of southern Brazil, Paraguay, and northern Argentina. All the taxa of group I are in this area. In addition five other species, from four different groups, are also found here. Probably most of these are the result of a secondary invasion of the area, as they all are from groups that are centered elsewhere today.

The Highlands Zone of South America contains the largest number of species of *Melanolophia*. The majority of the species of groups II, III, VI, and VII occur in the Andes Mountains; these number 46, or about three-fifths of the known species. This has been the most active area of evolution, and a number of species from the above groups have radiated out into other areas.

The second largest number of species of *Melanolophia* is found in Mexico and Central America, where 18 are known; most of these occur in the Tropical Wet and Dry Zone. Groups IV and V are centered here, with 10 species; the remaining eight represent four other groups.

The five species that are found in the United States, Canada, and southern Alaska belong to group V and are closely related to the species in Mexico and Central America.

Two species of *Melanolophia* are known from the Antilles. Both of these belong to group VI, which is concentrated in the Highlands Zone of South America. One of these species occurs in Jamaica and British Guiana; the other is known only from Dominica.

The distributional picture of the genus *Pherotesia* is similar to that of *Melanolophia*. Of the five most primitive species (group I), two are found in the Humid Subtropical Zone, and three are in the Highlands Zone, of South America. The more highly evolved species of group II are divided between the Highlands Zone of South America (six representatives) and Central America and Mexico. In Central America and Mexico, eight are from the Tropical Wet and Dry Zone and one is from the Highlands Zone.

The two species of *Melanotesia* are to be found in the Andes Mountains, and presumably are derived from some member of the preceding genus in the Highlands Zone.

TAXONOMY

The genera included in this paper are distinguished, among other criteria, by a number of secondary sexual characters on the male abdomen, such as the lateral, paired anterior hair pencils and the large lateral organs on the eighth segment. In North America, north of Mexico, no other genus possesses both of these characters, although they are present in the incompletely known *Galenara errantaria* McDunnough. *Galenara* McDunnough and *Eufidonia* Packard have a strongly developed posterior comb, and *Carphoides* McDunnough has this structure varying from being prominent to being almost completely absent (Rindge, 1958). A complete survey of the neotropical Ennominae has not been attempted. As far as is known at this time, no other genera have both these characters, with the exception of a small group of species from Mexico, for which a generic name apparently has not been proposed.

The moths included in this paper are relatively easy to place in the correct genus; greater difficulties arise when one is trying to place them at the specific level. It is strongly recommended that genitalic dissections be made as a routine part of the identification of

any material in this group, as the only safe way of determining most of the different species.

KEY TO GENERA

BASED ON EXTERNAL MORPHOLOGY

1. Forewings with veins R_1 and R_2 separate; wings black, with white spots . . . *Melanotesia*
Forewings with veins R_1 and R_2 stalked; wings brown 2
2. Color and pattern of forewings repeated on hind wings. *Melanolophia*
Hind wings paler than, and without pattern of, forewings *Pherotesia*

BASED ON MALE GENITALIA

1. Valves and their processes symmetrical . . 2
Valves and their processes asymmetrical . . .
. *Melanolophia*
2. Valves with small, sclerotized, raised, transverse processes beyond middle
. *Melanotesia*
Valves not as above 3
3. Vesica unarmed and gnathos bilobed
. *Melanolophia*
Vesica armed with one or more cornuti; if unarmed, gnathos rounded *Pherotesia*

BASED ON FEMALE GENITALIA

1. Signum present, very small in most species . 2
Signum absent *Pherotesia*
2. Corpus bursae membranous . . *Melanolophia*
Corpus bursae with posterior one-third to one-half heavily sclerotized *Melanotesia*

SYSTEMATIC DESCRIPTIONS

GENUS *MELANOLOPHIA* HULST

Melanolophia HULST, 1896, p. 357. DYAR, "1902" [1903], p. 326. SMITH, 1903, p. 77. BARNES AND McDUNNOUGH, 1917, p. 118. McDUNNOUGH, 1920b, p. 12, pl. 10, fig. 1 (venation of genotype); 1938, p. 163. MCGUFFIN, 1944, p. 124 (larvae). FORBES, 1948, pp. 18, 59, fig. 19 (venation of genotype, in part).

Head, front flat, smooth-scaled, with protruding scales at bottom; eyes large, wider than front; antennae of male bipectinate, with apex simple, pectinations arising from base of segments, each pectination with numerous setae and single terminal seta; antennae of female simple, rarely shortly pectinate, with each segment having several short setae and longer terminal pair; tongue present; labial palpi moderate, rising to about middle of eye, first and second segments long-scaled below, apical segment small, with short scales. Thorax with or without posterior tufts, with well-developed patagia; fore tibia of male with process one-half to two-thirds of length of tibia, of female, shorter; hind tibia with two pairs of spurs, with hair pencil in male usually well developed, rarely absent. Abdomen without tufts; male with third segment having medioventral row of bristles, usually with double hair pencil laterally at posterior portion of third segment; outer pair free or fused, in some species reduced or perhaps deciduous, rarely absent; abdomen usually with large double comb between seventh and eighth segments; terminal segment without plate.

Forewings broad, with 12 veins, and with elongate areole; R_{1+2} from top of cell, short to moderately stalked, in some species shortly coalesced with Sc above cell, R_2 with small cross vein to R_{3+4} , R_5 usually arising basad of cross vein; M_1 from upper angle, M_2 from about middle of dc, M_3 from lower angle; Cu_1 from near angle, Cu_2 from one-half of distance to angle; no fovea. Hind wings broad; margin concave between veins; frenulum strong in both sexes; usually with nine veins; Sc with moderate base, paralleling cell for about one-third or one-half of length, usually branching just before wing margin; R and M_1 from be-

fore upper angle, M_2 present but weak, M_3 from lower angle; Cu_1 from near angle, Cu_2 from near middle of cell; $m+ldc$ slightly curved.

MALE GENITALIA: Uncus usually thin and tapering from broad base, in some variously swollen, terminating in single point, rarely in two points; socius absent or represented by a few setae; gnathos strongly developed, well sclerotized, variable, enlarged medially, rounded or terminating in from one to three points; valves large, elongate, symmetrical, usually with costal tubercle and tuft of elongate setae from end; processes of valves arising from base, well developed, prominent, usually asymmetrical, in some species symmetrical or reduced, often with small, raised spine patch, circular or elongate, near costal tubercle in valvula; transtilla absent or weakly indicated; cristae and furca absent; anellus usually rather lightly sclerotized, elongate, variable; tegumen broad, with posterolateral angles on ventral surface produced; saccus narrower than tegumen, elongate, U-shaped; aedeagus short or of moderate length, relatively thick, usually with an elongate, sclerotized, finger-like projection posteriorly; vesica unarmed, or with small, weakly sclerotized plate.

FEMALE GENITALIA: Papillae anales simple, elongate, narrow, with apophyses posteriores approximately twice as long as apophyses anteriores; sterigma with circular or elliptical genital plate of concentric ridges or folds, variably modified or reduced, in some species lacking, with elongate lamella postvaginalis and lamella antevaginalis extending from edges of sinus vaginalis in many species, in some one or both reduced or absent; ductus bursae short or moderate in length, sclerotized or punctate, of even width, joining corpus bursae on right side, dorsally or ventrally; ductus seminalis arising from posterior surface of short extension of corpus bursae beyond junction with ductus bursae; corpus bursae slender, long to very long, membranous, lightly sclerotized or punctate anterior to junction with ductus bursae; signum very small, in some species lacking.

As there is a basic pattern of maculation that appears in many of the species, it is summarized here to avoid repetition in the descriptions of the wings. Forewings and hind wings concolorous brown, with rather indistinct pattern on both wings. Upper surface of forewings with t. a. line usually weak, arising between one-fifth and one-fourth of distance from base, curving outward into cell, then swinging slightly basally to inner margin; median line extending straight across wing basad of discal spot; t. p. line arising about seven-tenths of distance from base, subparallel outer margin to inner margin, in some species outwardly dentate on veins; s. t. line represented by small, dark, cellular spots, usually tending to be stronger in anterior part of wing; terminal line represented by small, intravenular marginal spots. Hind wings with median shade line indicated; extradiscal line complete, or almost so, tending to extend straight across the wing, in some species with small teeth on veins; s. t. line similar to that on forewings; intravenular spots present along wing margin. Under side of wings with maculation absent or weakly indicated, showing through from upper surface, with discal spots present, and with broad subterminal band present in some species.

EARLY STAGES: These have been described for three species (*canadaria* Guenée, *imitata* Walker, and *signataria* Walker) that occur in North America; all the others are unknown.

TYPE SPECIES: *Tephrosia canadaria* Guenée, by original designation.

RANGE: North America, Central America, and South America, extending from southern Alaska and southern Canada to central Argentina.

Melanolophia is a large genus that contains 75 species, with the majority of them occurring in South America. The members of the genus can be recognized by the venational and antennal characters given above, by the secondary sexual characters of the male abdomen, and by the genitalia. Many of the species closely resemble one another, and a study of the genitalia is strongly recommended to make certain the identification of the species.

KEY TO SPECIES BASED ON MALE GENITALIA AND SECONDARY SEXUAL CHARACTERS¹

1. Processes of valves asymmetrical. 2
Valves and their processes or ornamentation symmetrical. 69
- 2(1). Outer hair pencil on segment A₃ fused together terminally to form very prominent, apically curved process. 3
Outer hair pencil on segment A₃ with hairs separate, or lacking. 16
- 3(2). Comb on segment A₃ absent. 4
Comb on segment A₃ present. 5
- 4(3). Process of left valve extending to or beyond apex of valve, and having short, terminal row of spines. *intervallata*
Process of left valve not attaining apex of valve, and having an elongate, dorsal row of spines. *pseudovallata*
- 5(3). Processes of valves of equal length. *divergens*
Processes of valves of unequal length. 6
- 6(5). Process of right valve longer than process of left valve. 7
Process of left valve longer than process of right valve. 10
- 7(6). Uncus slender, tapering. *nebularia*
Uncus swollen, bifurcate. 8
- 8(7). Process of right valve extending beyond end of valve. 9
Process of right valve not reaching end of valve. *bugnathos*
- 9(8). Costal tubercle of valve with sclerotized tubercle at base, wider than high; apical area heavily covered with numerous, elongate, dark setae. *elegia*
Costal tubercle of valve with slightly raised, membranous, setose area at base. *mallea*
- 10(6). Process of left valve extending to or beyond end of valve. 11
Process of left valve not reaching end of valve. 13
- 11(10). Process of left valve very weakly S-shaped, with apical section straight. 12
Process of left valve straight, with apex sharply bent inwardly. *paraconara*
- 12(11). Process of left valve not reaching apex of valve. *muscosa*
Process of left valve extending beyond apex of valve. *orthoconara*
- 13(10). Process of right valve simple, blade-like

¹ The males of *fugitaria*, *madefactaria*, *rubrica*, *venatia*, and *vulsa* are unknown.

- 14
 Process of right valve terminating in a swollen, spinose process . . . *orthotis*
 14(13). Process of left valve slender, extending beyond middle of uncus, with slender row of spines extending along outer margin of terminal one-half of process and curving ventrally at apex . . . *semarcata*
 Process of left valve broad, more than one-third of width of valve, with median constriction, varying in length from posterior portion of anellus to beyond middle of uncus, with broad row of dorsal spines. 15
 15(14). Process of right valve extending to about middle of distance between posterior margins of anellus and tegumen . . . *immarcata*
 Process of right valve usually not extending to posterior margin of anellus, rarely long enough to reach that area . . . *agnataria*
 16(2). Processes of valves of equal length . . 17
 Processes of valves of unequal length . 18
 17(16). Uncus enlarged apically. . . *mutabilis*
 Uncus not swollen at apex. . . *fimbriata*
 18(16). Process of right valve longer than process of left valve 19
 Process of left valve longer than process of right valve 44
 19(18). Uncus slender, tapering to a single point 20
 Uncus swollen apically 34
 20(19). Process of right valve only slightly longer than left valve. 21
 Process of right valve at least one and one-half times as long as left process 27
 21(20). Swollen median portion of gnathos as wide as base of uncus. 22
 Swollen median portion of gnathos one-third to two-thirds of width of base of uncus. 24
 22(21). Processes of both valves with terminal portion capitate, rounded, with dense spined area occupying at least one-half of dorsal surface *imitata*
 Processes of valves not as above . . . 23
 23(22). Gnathos bifurcate, symmetrical . . . *substriata*
 Gnathos trifurcate, asymmetrical. *triloba*
 24(21). Swollen median portion of gnathos one-third of width of base of uncus, consisting of two sharp points separated by their own width 25
 Swollen median portion of gnathos two-thirds of width of base of uncus, consisting of gently swollen lateral protuberances and a small median swelling . . . *reductaria*
 25(24). Process of left valve extending to posterior margin of tegumen *trisurca*
 Process of left valve extending to posterior margin of anellus. 26
 26(25). Process of left valve terminating in a single, heavy, elongate spine *accurata*
 Process of left valve with numerous spines on dorsal surface of apical region. *vegranda*
 27(20). Process of right valve one and one-half times as long as left process; gnathos with three prominent lobes, the central one asymmetrical. *triloba*
 Process of right valve about twice as long as left process; gnathos with one or two symmetrical lobes 28
 28(27). Gnathos with a single lobe, bluntly pointed or broad, in some cases with apex shallowly indented medially. . 29
 Gnathos deeply bifurcate 30
 29(28). Process of right valve terminating in very heavy, inwardly directed spine. . *corza*
 Process of right valve without apical spine *subatrata*
 30(28). Lateral hair pencils on A₃ absent. *muscitincta*
 Lateral hair pencils on A₃ present . . 31
 31(30). Gnathos with two small, parallel, closely set median points. *apicalis*
 Gnathos with two large, widely spaced, curving median points. 32
 32(31). Process of left valve enlarged terminally and with row of spines posteriorly *bostar*
 Process of left valve very small, pointed 33
 33(32). Genitalia very attenuate; process of right valve swollen before apex . . *attenuata*
 Genitalia of normal length; process of right valve not swollen . . . *tenebrosa*
 34(19). Uncus broadly swollen, usually terminating in two distinct points 35
 Uncus not swollen and bifurcate apically 41
 35(34). Process of right valve extending beyond apex of uncus 36
 Process of right valve not extending beyond end of uncus 38
 36(35). Gnathos rounded or somewhat truncate medially. *dislocata*
 Gnathos bifurcate medially 37
 37(36). Processes of both valves extending beyond posterior margin of tegumen *divergens*

- Process of left valve not attaining posterior margin of tegumen *rima*
- 38(35). Outer margins of gnathos convex, median cleft small, shallow, less than one-fifth of length of median protuberance. .39
- Outer margins of gnathos straight, median cleft prominent, deep, extending one-half to three-fourths of length of median protuberance *eucheria*
- 39(38). Uncus with constriction before enlarged terminal portion40
- Uncus without constriction42
- 40(39). Process of right valve extending to middle of uncus. *minca*
- Process of right valve not attaining posterior margin of tegumen . . . *spatiosata*
- 41(34). Gnathos with two large, divergent, curving median points *flexilinea*
- Gnathos with two small, lateral projections *canadaria*
- 42(39). Uncus bluntly wedge-shaped; gnathos with strong lateral and median lobes. *commotaria*
- Uncus and gnathos not as above43
- 43(42). Uncus scoop-shaped. *dislocata*
- Uncus slender *dextera*
- 44(18). Process of left valve at least one and one-half times as long as right process .45
- Process of left valve only slightly longer than process of right valve.53
- 45(44). Uncus short, triangular, with posterolateral sides flat.46
- Uncus elongate, posterolateral sides concave48
- 46(45). Process of left valve of uniform width; process of right valve with very small group of setae near end . . . *praeapicata*
- Process of left valve with outer one-half about twice as wide as basal portion; process of right valve heavily setose near end.47
- 47(46). Process of left valve having outer one-half sharply swollen, and with a straight row of setae along its entire distal side *vitta*
- Process of left valve gradually increasing in width, and with a curved row of setae on its apical one-fourth. . . *piura*
- 48(45). Median portion of gnathos one-fourth of width of base of uncus, in form of two small points *inatrata*
- Median portion of gnathos at least one-half of width of base of uncus . . .49
- 49(48). Process of left valve extending beyond apex of uncus50
- Process of left valve not attaining apex of uncus.51
- 50(49). Gnathos with recurving points, in width less than width of base of uncus *signataria*
- Gnathos with divergent points, in width greater than width of base of uncus. *imperfectaria*
- 51(49). Gnathos in form of two elongate, widely separated points, with apices slightly recurving *sadrinaria*
- Gnathos not as above.52
- 52(51). Process of left valve terminating in a single heavy spine *reducta*
- Process of left valve with numerous short setae apically *olivescens*
- 53(44). Gnathos with two distinct, adjacent, median points54
- Gnathos variously swollen, not as above62
- 54(53). Gnathos very long, slender, tapering, terminating in two short, asymmetrical points; process of left valve a thin, tapering, spine-like arm . . . *perversa*
- Gnathos not attenuated medially; left process not spine-like55
- 55(54). Gnathos with median points divergent, well separated *imperfectaria*
- Gnathos with median points adjacent, separated by less than their own length56
- 56(55). Anellus Y-shaped; processes of both valves with terminal spines only . .58
- Anellus subrectangular; both valves with row of prominent spines on inner margin of outer one-half of processes . .57
- 57(56). Processes of both valves straight, long and slender, with a very narrow row of spines extended longitudinally from base *conspicua*
- Processes of both valves wider, left one curved medially, both with wide band of spines on distal one-half or two-thirds of length. *eudoxa*
- 58(56). Process of right valve ending anterior to spine patch60
- Process of right valve ending lateral or posterior to spine patch59
- 59(58). Length of median points of gnathos no greater than width *delinquaria*
- Length of median points of gnathos about one and one-half times as long as width *producta*
- 60(58). Process of left valve extending to middle of uncus. *modica*
- Process of left valve not extending beyond posterior margin of tegumen. . . .61
- 61(60). Processes of valves of almost the same shape and size *parma*
- Processes of valves strongly asymmetrical *munda*

- 62(53). Process of left valve not extending beyond base of uncus63
 Process of left valve extending to middle of uncus.65
- 63(62). Anellus sharply narrowed medially, about one-fifth of width of base . . .*reducta*
 Anellus only slightly narrowed medially64
- 64(63). Processes of both valves of similar shape, enlarged terminally, with several terminal spines*umbrosa*
 Processes of valves of different shapes*atrifascia*
- 65(62). Processes of both valves enlarged terminally, with numerous heavy spines arising on outer margin and curving dorsally under each process . *penicilla*
 Processes of both valves tapering, with a few small spines, not as above . . .66
- 66(65). Gnathos bifurcate67
 Gnathos with central projection . . .68
- 67(66). Process of left valve extending beyond apex of uncus*signataria*
 Process of left valve extending to middle of uncus.*fimbriata*
- 68(66). Uncus slender, tapering to single point*homofascia*
 Uncus wide, concave ventrally, with two points.*isoforma*
- 69(1). Processes of valves reaching middle of uncus or beyond70
 Processes of valves not extending beyond posterior portion of tegumen. . . .72
- 70(69). Processes of valves extending well beyond apex of uncus, extending almost to end of valves*centosa*
 Processes of valves not extending beyond apex of uncus71
- 71(70). Processes of valves with apical spines only*delinquaria*
 Processes of valves with spines longitudinally arranged in outer one-half of processes*isometra*
- 72(69). Processes of valves with elongate, slender, tapering terminal section73
 Processes of valves swollen apically, more or less capitate.75
- 73(72). Gnathos with a single, tapering point*sadrina*
 Gnathos bifurcate74
- 74(73). Terminal one-half of processes of valves in form of thin, tapering, elongate spine*centralis*
 Terminal one-half of processes of valves not spine-like, slightly tapered at apex, the latter with a number of dorsal setae*parma*
- 75(72). Uncus slender, tapering76
- Uncus with terminal portion swollen before apex78
- 76(75). Outer hair pencil on segment A₃ fused together terminally to form very prominent, apically curved process*divergens*
 Outer hair pencil on segment A₃ with hairs separate.77
- 77(76). Valves with prominent costal tubercle and strong spine patch at its base, and with processes very short, extending only one-half of width of base of valve*limosa*
 Valves with weak costal swelling and small spine patch, with processes as long as width of base of valve . . .
- 78(75). Gnathos bifurcate79
 Gnathos with median lobe rounded*argilaria*
- 79(78). Gnathos deeply bifurcate . . .*flexilinea*
 Gnathos with shallow notch*synargilaria*

GROUP I

The upper surface of the wings of the species in this group are buff or pale brown in color, variably overlain with darker brown scales, and the cross lines are rather weakly defined but tend to be rather straight, particularly the extradiscal line of the secondaries. The species are among the smallest to be found in *Melanolophia*. In the length of the forewings they vary from 15 to 20 mm., with the species averaging from about 17 to 19 mm.

The male genitalia of each species have a simple uncus and a small bifurcate gnathos, and, in most species, an anellus with the median portion constricted. Four of the species have the process of the left valve longer than the right, whereas in the other two either the reverse is true or the processes are of equal length. The abdomen has the lateral tufts on A₃ weakly represented or lacks them.

In the female genitalia the sterigma is in the form of a symmetrical, round, or elliptical genital plate. The lamella antevaginalis is a convoluted, lip-like structure covering the anterior portion of the sinus vaginalis, and the lamella postvaginalis is a large, weakly sclerotized, lobate process. The ductus bursae is elongate and joins the long to moderately long corpus bursae dorsally.

The early stages and food plants of all the

species in this group are unknown.

Six species are placed in group I, and they all occur in southeastern South America. Their distribution is centered in the Humid Subtropical Zone, and they fly at elevations of from about sea level up to 2000 or 3000 feet. The adults of the species have been captured in virtually every month of the year.

***Melanolophia delinquaria* (Walker),
new combination**

Plate 3, figure 1; text figures 5, 98

Boarmia delinquaria WALKER, 1860, p. 360.

Cymatophora modesta W. WARREN, 1904, p. 352. New synonymy.

This small pale species with moderately well-defined maculation occurs in southeastern South America. The dentate t. p. line passes fairly close to the distal spot, and it is sometimes shaded outwardly with dark scaling. In many specimens there is a dark marginal spot opposite the cell, although it may be represented as a thickening of the s. t. line only.

MALE: Head, vertex and front pale buff or grayish brown, front with dark brown scales across top, a small spot on each side by eye and, in some specimens, with scattered brown scales; palpi with first segment pale buff below at base, distally and remaining segments with mixed brownish gray and brown scales. Thorax pale buff above; collar grayish brown; patagia with brown transverse band near end in some specimens; below pale buff; legs pale buff, variably spotted with brown or dark brown scales. Abdomen pale grayish brown, with scattered brown scales above; paler below.

UPPER SURFACE OF WINGS: Forewings with ground color pale buff or pale grayish brown, with scattered pale brown and darker brown scales; cross lines weakly defined, medium to dark brown, of basic pattern; t. a. and median lines obsolescent; discal spot blackish brown or grayish black, small; t. p. line dentate on veins, passing between 1 and 2 mm. from discal spot, in some specimens weak or obsolescent in middle of wing, shaded distally with dark brown above inner margin; s. t. line arising equidistantly between apex and origin of t. p. line, in some specimens slightly nearer outer margin, of blackish brown spots, becoming

obsolescent in lower portion of wing, with spots in cells M_1 and M_2 enlarged, in some specimens tending to be shaded distally with dark brown; fringe concolorous with wing. Hind wings concolorous with forewings; median line shaded distally by brown scales in some specimens; discal spot blackish brown, small; extradiscal line broadly shaded distally by dark brown or blackish brown, especially in lower part of wing; s. t. line varying from being complete to being partially obsolete; fringe like that on primaries.

UNDER SURFACE OF WINGS: Forewings pale grayish brown, evenly sprinkled with brown scales except along inner margin; hind wings slightly paler; discal spots blackish brown, small; otherwise without definite maculation except for weak to prominent, broad, dull black subterminal area on primaries and, in some specimens, faint indications of other cross lines.

LENGTH OF FOREWING: 16 to 19 mm.

FEMALE: Similar to male, but with upper surface of forewings slightly more heavily sprinkled with dark brown scales, and with cross lines appearing slightly less clearly defined. Under surface also slightly more heavily dusted with brown scales.

LENGTH OF FOREWING: 15 to 19 mm.

MALE GENITALIA: Uncus tapering, curving ventrally, terminating in single, sharp point; socius absent; gnathos slender, slightly enlarged medially and having two posteriorly directed, rugose projections, in length equal to width of gnathos at point of origin and separated by distance slightly less than their length; each valve with prominent costal tubercle and tuft of elongate setae; valvula with spine patch and posterior ridge of elongate setae; processes of valves slightly asymmetrical, one on left side slightly longer than that on right; right process narrow, curving posteriorly along margin of valve, extending to beyond middle of uncus, becoming slightly more heavily sclerotized posteriorly, swollen terminally and having numerous heavy setae arising dorsally and from outer surface, directed toward apex of uncus; left process similar to right one but slightly longer and only slightly swollen apically, with numerous short setae arising on outer surface near apex, becoming broader in area and curving dorsally below apex, termi-

nating in several longer, heavier setae directed inwardly; anellus with very broad, semicircular base, sharply narrowed posteriorly, then expanding into Y-shaped apical portion; tegumen broadest posteriorly; saccus slightly narrowed, broadly U-shaped; aedeagus slightly shorter than combined lengths of uncus, tegumen, and saccus, with tapering, sclerotized projection posteriorly, and with several longitudinal striations on surface; vesica with small, weakly sclerotized plate and several concentric circles anteriorly. Abdomen with both sets of tufts on A_3 present, outer ones short and sparse; posterior double comb consisting of 10 to 12 modified, well-spaced setae medially on each side, laterally with multiple rows of setae.

FEMALE GENITALIA: Sterigma with prominent, circular genital plate, area anterior to sinus vaginalis slightly more slender and more heavily sclerotized than posterior area; lamella antevaginalis strongly convoluted, lip-like, covering about one-half of opening of sinus vaginalis; lamella postvaginalis short, funnel-like, tapering anteriorly, approximately twice as long as wide; ductus bursae elongate, well sclerotized, rugose, slightly tapering, joining corpus bursae dorsally; corpus bursae moderately long, lightly sclerotized, and rugose anterior to ductus bursae; signum very small.

TYPES: Walker described *delinquaria* from a single male specimen; it is now in the University Museum at Oxford, England. Warren had a single female before him when he described *modesta*; this is in the British Museum (Natural History).

TYPE LOCALITIES: "Rio Janeiro," [Brazil] (*delinquaria*); Sapucay, Paraguay (*modesta*).

RANGE: Southern Brazil (the states of Minas Gerais, São Paulo, Paraná, Rio de Janeiro, Santa Catarina, and Rio Grande do Sul), southern Paraguay, and the intervening portion of northeastern Argentina (the province of Misiones). The species is found in the Humid Subtropical Zone, and it apparently ranges in elevation from sea level to about 2800 feet. It flies throughout most of the year, as specimens have been examined from every month except February, June, and August. (See Appendix for locality data of specimens examined.)

REMARKS: Seventy-three specimens and 21

genitalic dissections were studied. This species is rather variable in its wing color and in the strength of the cross lines on the wings. The most obvious features are usually the t. p. line, as it is often shaded distally opposite the cell and above the anal margin, the thickened s. t. line opposite the cell, the dark scalation that extends all the way to the wing margin, or part way, and the almost straight, outwardly shaded median line on the secondaries.

The male genitalia are distinguished by the very long, slender processes of both valves, with the one on the left side being only slightly longer than the right one, by the small, bifid gnathos, and by the medially sharply constricted anellus. The round, symmetrical sterigma, the strongly convoluted, lip-like lamella antevaginalis, and the short, funnel-like lamella postvaginalis in the female genitalia are characteristic of this species.

***Melanolophia modica*, new species**

Plate 3, figure 2; text figures 6, 99

This species is slightly larger than the preceding one, and it is very similar to it in color and maculation. The present species is distinguished by the more sharply bent t. a. line and by the straighter t. p. line. The genitalia offer the best characters for separating the two species. The species is found in southeastern South America.

MALE: Head, thorax, and abdomen similar to those of *delinquaria*.

UPPER SURFACE OF WINGS: Forewings with ground color pale buff, with scattered pale brown and darker brown scales; cross lines varying from being complete to being partially obsolescent, narrow, dark brown, similar to those of *delinquaria*; t. a. line tending to be sharply curved inwardly in radial cell, subparalleling outer margin to inner margin, obsolescent in some specimens; median line weakly shaded distally with brown scales in many specimens; t. p. line passing about 2 mm. from discal spot; s. t. line with anterior spots heaviest, shaded distally by grayish white scales and marked with blackish brown in cells M_1 , M_2 , and M_3 . Hind wings concolorous with forewings; median line often geminate, with inner line stronger; discal spot blackish brown, smaller than that on forewings; extradiscal line straight or very

slightly curved, variably shaded with brownish black in lower part of wing; s. t. line varying from being complete to being partially obsolete; fringe like that on primaries.

UNDER SURFACE OF WINGS: Forewings pale buff or pale grayish brown, evenly and lightly sprinkled with brown scales except along paler inner margin; hind wings slightly paler; discal spots blackish brown, small; otherwise without definite maculation except for dark s. t. band, broad anteriorly, narrowed posteriorly, and, in some specimens, faint traces of other cross lines.

LENGTH OF FOREWING: 17 to 21 mm.; holotype, 21 mm.

FEMALE: Similar to male, but with upper surface tending to be more heavily overlain with ochraceous, gray, and dark grayish brown scales, and with cross lines less clearly defined. Under surface paler than that of male.

LENGTH OF FOREWING: 18 to 20 mm.; allotype, 18 mm.

MALE GENITALIA: Similar to those of *delinquaria*, differing mainly in the following characters: gnathos with two posteroventrally directed, rugose projections, in length almost twice as long as width of gnathos at point of origin and separated by distance slightly less than their length; processes of valves asymmetrical, one on left side longer than that on right; right process with broad, weakly sclerotized base curving with margin of valve, constricted medially, outer one-half slightly widened posteriorly, with apex bluntly pointed, and with a number of short, inwardly directed setae arising from outer angle of apex, extending posteriorly as far as anterior portion of gnathos; left process extending to beyond middle of uncus, similar in outline to right process but with distal portion more elongate, apex with a number of short, slender setae arising from outer and dorsal surfaces, with innermost seta much thickened; aedeagus with rather weakly sclerotized projection posteriorly, and with several dorsal longitudinal striations; vesica with small, weakly sclerotized plate. Abdomen with both sets of tufts on A₃ present, outer ones weakly developed; posterior double comb consisting of 12 or 13 modified, well-spaced setae medially on each side, laterally with multiple rows of setae.

FEMALE GENITALIA: Sterigma with prominent, slightly elliptical genital plate, with areas lateral and anterior to sinus vaginalis narrower than posterior area, anterior area consisting of about eight concentric, sclerotized ridges, posterior area becoming membranous caudally; lamella antevaginalis strongly convoluted, lip-like, covering about one-half of opening of sinus vaginalis; lamella postvaginalis broad, lightly sclerotized, rounded posteriorly, with median, more heavily sclerotized digitate piece, slightly tapering anteriorly, approximately twice as long as wide; ductus bursae elongate, well sclerotized, rugose, joining corpus bursae dorsally; corpus bursae moderately long, enlarged anteriorly; signum very small.

TYPES: Holotype, male, and allotype, female, "Santa Cruz, Bresil meridionale." Paratypes: *Brazil*: Same data as types, one male, one female; Espíritu Santo, one male; Casa Br[anca, São Paulo], two males; Castro, Paraná (E. D. Jones), eight males; Rio [de] Janeiro, one male; Hansa Humboldt, Santa Catarina, July, elevation 60 meters (A. Maller), one male, one female; Jaragua do Sul, Santa Catarina, December (Hoffmann), one female; no further data, two males. *Paraguay*: Sapucay [Paraguari], September (W. T. Foster), one male; Villarrica, December, one male; Independencia, September, one male; no further data, two males. *Argentina*: San Juan, "1-11" (J. Foerster), one male. The holotype and allotype are in the collection of the United States National Museum; paratypes are in the collections of that institution, of the American Museum of Natural History, and of the British Museum (Natural History).

RANGE: Southern Brazil (the states of Espíritu Santo, São Paulo, Paraná, Rio de Janeiro, and Santa Catarina), Paraguay, and Argentina (the province of San Juan). The species extends from the Humid Subtropical Zone in the east to the foothills of the Andes Mountains in the west. It is apparently a species of low elevations, as none of the material examined was captured at elevations above 2000 feet. The moth has been captured in July, September, November, and December.

REMARKS: Twenty-seven specimens and 10 genitalic dissections were studied. The maculation of this species is rather variable in its clarity, as far as can be told from the speci-

mens studied. Specimens from Brazil tend to be the largest and palest of those examined, while the single Argentine male studied was smaller and had a darker ground color and darker markings.

Melanolophia modica is very similar to *delinquaria* but is slightly larger. The maculation tends to be better defined, with a sharply curved t. a. line and a straighter but more dentate t. p. line in the present species.

In the male genitalia the process of the left valve is longer than that of the right valve, and both are enlarged terminally, as in *delinquaria*. In *modica* the processes are thicker, the terminal swelling is greater, and the apex of the right process is tapered, rather than being truncate or rounded as in *delinquaria*. The female genitalia of these two species are very similar also, but *modica* can be recognized by the slightly more elongate sterigma, narrowed laterally rather than anteriorly, and by the less sharply tapered lamella postvaginalis.

***Melanolophia apicalis* (W. Warren)**

Plate 3, figure 3; text figures 7, 100

Cymatophora apicalis W. WARREN, 1900, p. 195.

Melanolophia apicalis: PROUT, 1910a, p. 341.

This small species is characterized by buff or dull brown wings above and by the fact that the median line is usually shaded distally by brownish black, and the median and t. p. lines are much closer together at the inner margin than at the costa. It occurs in south-eastern South America.

MALE: Head, thorax, and abdomen similar to those of *delinquaria*, the last with scattered brown scales, tending to form paired spots at base of abdomen in some specimens.

UPPER SURFACE OF WINGS: Forewings with ground color pale buff or pale gray, variably overlain with brown, dark brown, and grayish brown scales; cross lines usually distinct, dark brown; t. a. line extending straight across wing after crossing radial vein, at right angle to inner margin, more or less inwardly dentate on veins; median line straight, parallel with t. a. line, broadly shaded distally with dark brown or brownish black scales; discal spot blackish brown, small; t. p. line subparalleling outer margin in upper part of wing, swinging basally below, meeting inner margin near

median line or in distal shading thereof, stronger and thickened in some specimens opposite discal spot; s. t. line arising nearer apex than to origin of t. p. line, thus forming broad subterminal area, of blackish brown spots in upper part of wing, absent below, with spots in cells M_1 and M_2 tending to be largest, spot in cell R_5 shaded distally with blackish brown scales to margin; terminal line of small black intravenular spots, partially obsolescent in some specimens; fringe concolorous with wing. Hind wings concolorous with forewings; median line shaded distally by brown scales in some specimens; discal spot blackish brown, small; extradiscal line absent in upper part of wing, dark brown or blackish brown in middle and lower part of wing, variably shaded distally with dark scales; s. t. line varying from being complete to being nearly absent; terminal line and fringe like those on primaries.

UNDER SURFACE OF WINGS: Forewings pale grayish brown, evenly overlain with brown or brownish gray scales except along inner margin; hind wings more heavily overlain with brown scales; discal spots blackish brown, small; otherwise without maculation except for weakly indicated s. t. band in upper part of forewings and, in some specimens, very faint indications of other cross lines.

LENGTH OF FOREWING: 17 to 20 mm.

FEMALE: Similar to male, but with upper surface of wings tending to be slightly reddish brown distal to t. p. line, and to have cross lines slightly better defined. Under surface with s. t. band darker.

LENGTH OF FOREWING: 18 to 19 mm.

MALE GENITALIA: Similar to those of *delinquaria*, differing mainly in the following characters: gnathos tapering ventrally, slightly swollen at mid-line, with two small, posteroventrally produced, sharply pointed projections; processes of valves asymmetrical, one on right side twice as long as that on left; right process narrow, arising from broad base, with slight constriction two-sevenths of distance from base, slightly more heavily sclerotized distally, straight or very slightly sinuous, with band of short, closely appressed setae on outer surface, extending beyond apex and curving inwardly, the process extending beyond apex of uncus; left process extending to posterior portion of anellus, arising from

broad base, terminal one-third swollen, more heavily sclerotized, with posterior edge enlarged and flattened, with dense band of short setae arising therefrom, terminating in large, single, posteriorly directed spine at inner margin; anellus with rounded base, gradually tapering posteriorly, then both sides enlarged into rugose, semicircular processes, posterior to these with a weakly sclerotized transtilla-like process, indented medially; aedeagus slightly longer than combined lengths of tegumen and saccus, with tapering, sclerotized projection posteriorly, with several longitudinal striations on dorsal surface; vesica unarmed. Abdomen with both sets of tufts on A_3 present, outer ones shorter and weaker than inner; posterior double comb consisting of nine or 10 modified, well-spaced setae medially on each side, laterally with numerous setae very closely spaced.

FEMALE GENITALIA: Sterigma with elliptical genital plate area posterior to sinus vaginalis much larger than anterior or lateral areas; lamella antevaginalis lightly sclerotized, convoluted, lip-like, covering about one-third of opening of sinus vaginalis; lamella postvaginalis large, weakly sclerotized, slightly longer than wide, widest medially, with median area slightly more heavily sclerotized, tapered posteriorly, with shallow median cleft; ductus bursae elongate, sclerotized, rugose, joining corpus bursae dorsally; corpus bursae elongate, lightly sclerotized and rugose adjacent to ductus bursae; signum very small.

TYPE: In the British Museum (Natural History).

TYPE LOCALITY: Castro, Paraná, Brazil.

RANGE: Southern Brazil (the states of Minas Gerais [Fletcher, *in litt.*], Paraná, Santa Catarina, São Paulo [Fletcher, *in litt.*], and Rio Grande do Sul), Argentina (the provinces of Buenos Aires and Rio Negro), and southern Paraguay. The species ranges from the Humid Subtropical Zone in Brazil to the Semiarid and Desert Zones in Argentina. It has been taken at altitudes ranging from about sea level to 2000 feet in the months of February, April, May, July, August, November, and December. (See Appendix for locality data of specimens examined.)

REMARKS: Twenty-three specimens and 10 genitalic dissections were studied. This spe-

cies has variable maculation, as the color of the wings and the strength of the cross lines differs somewhat from specimen to specimen. Some of this variability may be geographic, as the single Argentine male examined is quite small and darker than the Brazilian specimens.

This species is browner in color than is the preceding, with the t. p. line much closer to the discal spot, which then curves basad to meet the inner margin close to the median line. The heavily shaded median line is also characteristic of *apicalis*.

The male genitalia are distinguishable by the fact that the process of the right valve is considerably longer than that of the left. The latter extends to about the base of the uncus and has the apex with transversely arranged setae, curving posteriorly at their ends. The female genitalia have a large lamella postvaginalis and an asymmetrical sterigma that is much larger posteriorly than anteriorly.

***Melanolophia vitta*, new species**

Plate 3, figure 4; text figure 8

This is a small, pale species that is similar to *apicalis*. The upper surface of the wings tends to be slightly browner in the present species; the median line is obsolescent, the t. p. line is slightly heavier and more dentate, and the dark area opposite the cell in the terminal area is heavier, than in *apicalis*. The genitalia offer the safest character for identifying *vitta*. This species occurs in southern Brazil.

MALE: Head, thorax, and abdomen like those of *delinquaria*.

UPPER SURFACE OF WINGS: Forewings with ground color pale buff, more or less overlain with pale ochraceous or pale grayish brown scales, and with scattered brown and dark brown scales; cross lines varying from being obsolescent to being clearly represented, medium to dark brown; t. a. line weakly represented, strongly outwardly bowed in cells; median line obsolescent, represented by costal spot in some specimens; discal spot blackish brown, small; t. p. line dentate on veins, passing about 1 mm. from discal spot, shaded distally by brown; s. t. line arising nearer apex of wing than to origin of t. p. line, of blackish brown spots, becoming obsolescent in lower portion of wing, with spots in

cells M_1 and M_2 enlarged and broadly shaded distally with blackish brown, extending to wing margin and into most of cell R_5 ; terminal area slightly darkened in some specimens; fringe concolorous with wing. Hind wings concolorous with forewings, tending to be less heavily overlain with ochraceous scales; median shade line and discal spot obsolescent; extradiscal and s. t. lines obsolescent in upper one-half of wing, the former weakly shaded distally with ochraceous brown above anal margin; fringe like that on primaries.

UNDER SURFACE OF WINGS: Forewings pale buff, lightly sprinkled with dark grayish brown scales except along inner margin; hind wings concolorous with, or slightly paler than, forewings; discal dots small or obsolescent; otherwise without definite maculation except for broad, dark, subterminal band on all wings except for pale buff apical area of forewings.

LENGTH OF FOREWING: 19 mm.

FEMALE: Unknown.

MALE GENITALIA: Uncus broadly triangular, with flat lateral sides and ventrally directed apical point; socius absent; gnathos a broad sclerotized band of even width, medially with two adjacent, elongate, pointed, posteriorly directed, spine-like processes, in length subequal to width of gnathos band; each valve with costal swelling; valvula with a small, weak group of setae in place of spine patch; processes of valves asymmetrical, one on left side about twice as long as right one; right process arising from wide base, sharply constricted medially, apical section more heavily sclerotized, outer margin swollen before apex and having numerous, short, posteriorly directed setae, these extending dorsally along distal margin and terminating in single large seta below apex of process, the latter extending beyond posterior margin of anellus; left process extending to posterior portion of uncus, with enlarged basal section, continued posteriorly as long, slender arm, distal section enlarged on outer side and bearing a band of short, posteriorly directed setae, with apical seta larger than others; anellus constricted medially from broad base, enlarged distally, weakly concave medially; tegumen with prominent posterolateral angles, saccus elongate, slightly tapering; aedeagus varying in length from subequal to, to

longer than, combined lengths of uncus, tegumen, and saccus, with tapering, sclerotized projection posteriorly, and with several longitudinal striations on dorsal surface; vesica unarmed. Abdomen with both sets of tufts on A_3 present, outer ones shorter and weaker than inner; posterior double comb consisting of about nine modified, well-spaced setae medially on each side, laterally with numerous setae very closely spaced.

FEMALE GENITALIA: Unknown.

TYPES: Holotype, male, Petropolis, Brazil. Paratype, male, Rio [de] Janeiro, Brazil. Both specimens are in the collection of the British Museum (Natural History).

RANGE: Brazil (the state of Rio de Janeiro).

REMARKS: Two specimens and two genitalic preparations were studied. This species is slightly darker in color than the preceding species, and it has a larger dark patch at the margin of the forewings opposite the cell. On the under surface, the broad, dark subterminal band distinguish this species from the preceding ones.

The male genitalia of *vitta* can be distinguished by the very long process of the left valve, which is about twice as long as the process of the right valve. Other distinguishing features are the triangular uncus and the band-like gnathos with the two elongate, slender projections medially.

***Melanolophia praeapicata* (W. Warren),
new combination**

Plate 3, figure 5; text figures 9, 101

Apicia praeapicata W. WARREN, 1900, p. 208.

This is a small, pale species, with poorly defined maculation on the primaries, but with a well-defined, straight, extradiscal line, shaded inwardly with pale buff scales and shaded outwardly with dark brown scales, on the upper surface of the secondaries. It occurs in southeastern South America.

MALE: Head, vertex and front pale buff or pale grayish brown, front largely dark brown across top, both with variable number of scattered brown scales; palpi pale buff, with variable number of scattered brown and dark brown scales. Thorax above pale grayish brown; collar brownish gray; patagia with narrow, median, brown, transverse bar; below pale buff; legs pale buff, variably spotted with brown and dark brown scales. Abdomen pale

grayish brown above, with scattered brown scales; paler below.

UPPER SURFACE OF WINGS: Forewings with ground color pale ochraceous brown, with scattered dark brown scales; cross lines weakly defined, brown; t. a. line weak; median cross line obsolescent; discal spot blackish brown, small; t. p. line extending straight across wing, in some specimens weakly dentate or thickened on veins; subterminal and terminal areas slightly darker than basal portion of wing; s. t. line very weakly defined, usually represented by small spots in cells M_1 , M_2 , and Cu_2 , upper ones shaded outwardly in some specimens by faint, pale line; fringe concolorous with wing. Hind wings concolorous with forewings; median line near blackish brown discal spot; extradiscal line very prominent, dark brown, straight, shaded basally by band of ground color, distally by very narrow pale band and broader, rather nebulous band of dark brown; outer portion of wing slightly darker than basal part; s. t. line incompletely represented by dark spots; fringe like that on primaries.

UNDER SURFACE OF WINGS: Forewings pale grayish brown, evenly sprinkled with brown scales except along inner margin; hind wings slightly paler; discal spots blackish brown, small; dark subterminal band present on all wings, otherwise without maculation except for weak indication of extradiscal line on secondaries in some specimens.

LENGTH OF FOREWING: 17 to 19 mm.

FEMALE: Similar to male, but with upper surface of wings slightly more heavily dusted with brown scales in some specimens. Under surface also tending to be slightly more heavily dusted with brown, and with maculation slightly heavier.

LENGTH OF FOREWING: 16 to 19 mm.

MALE GENITALIA: Uncus triangular in outline, terminating in single, recurved point; socius absent; gnathos rather broad, less heavily sclerotized on median line, each side thereof with small, rugose, diagonal swelling; each valve with moderate costal swelling; valvula without raised spine patch but with group of setae in its place; processes of valves asymmetrical, one on left side twice as long as that on right; right process narrow at base, becoming slightly thicker distally, weakly S-shaped, with bluntly pointed apex and small

group of short, inwardly directed spines arising from outer portion of apex, extending to posterior portion of anellus; left process reaching almost to end of valve, slender, becoming more heavily sclerotized one-third of distance from base, apex with numerous short setae on dorsal surface; anellus with broadly rounded base, narrowed medially, expanding posteriorly into Y-shaped apical portion; tegumen with parallel sides, saccus somewhat narrowed and rounded anteriorly; aedeagus slightly shorter in length than combined lengths of uncus, tegumen, and saccus, with slender, tapering, sclerotized projection posteriorly, and with several longitudinal striations on dorsal surface; vesica unarmed. Abdomen with both sets of tufts on A_3 absent; posterior double comb consisting of nine to 11 modified, well-spaced setae medially on each side, laterally with numerous closely spaced setae.

FEMALE GENITALIA: Sterigma with lightly sclerotized, elliptical or oval genital plate, area posterior to sinus vaginalis more membranous; lamella antevaginalis lightly sclerotized, convoluted, lip-like, covering about one-third of opening of sinus vaginalis; lamella postvaginalis large, slightly longer than wide, tapering anteriorly and becoming funnel-like, flattened posteriorly, with shallowly cleft posterior margin; ductus bursae elongate, well sclerotized, posterior end more heavily so, rugose, both ends tapered, joining corpus bursae dorsally; corpus bursae elongate, lightly sclerotized and rugose adjacent to ductus bursae; signum very small.

TYPE: This species was described from one male, and it is now in the British Museum (Natural History).

TYPE LOCALITY: Petropolis, Brazil.

RANGE: Southern Brazil (the states of Minas Gerais, São Paulo, Paraná, Santa Catarina, and Rio de Janeiro), southern Paraguay, and the intervening portion of northeastern Argentina (the province of Misiones). This species is found mainly in the Humid Subtropical Zone, and it apparently ranges in elevation from sea level to about 2000 feet. The species flies throughout most of the year, as specimens have been examined that were caught in January, February, April, May, June, July, August, September, November, and December. (See Appendix for

locality data of specimens examined.)

REMARKS: Thirty-seven specimens and 11 genitalic dissections were studied. There is some variability in the color of the upper surface of the wings, due largely to the amount of dark scaling that is present. The females tend to be somewhat darker than the males for the same reason.

The male genitalia are recognized by the triangular uncus, by the shallowly bifurcate and rugose gnathos, and by the fact that the very long and slender process of the left valve is twice as long as the process of the right valve. In the female genitalia, the elliptical, weakly sclerotized sterigma, the short, convoluted lamella antevaginalis, and the large, posteriorly indented lamella postvaginalis are diagnostic.

Melanolophia centosa (Schaus), new combination
Plate 3, figure 6; text figures 10, 102

Tephrosia ? *centosa* SCHAUS, "1900" [1901a], p. 185.

This is a small, pale species in which the cross lines of the upper surface of the forewings tend to be straight and parallel. The genitalia have good diagnostic characters. *Melanolophia centosa* occurs in southern Brazil.

MALE: Head, vertex and front pale grayish white, with scattered brown scales; palpi with mixed pale grayish white and brown scales. Thorax above and below pale grayish white, with scattered brown scales above; collar tending to be slightly darker; legs grayish white, variably spotted with brown scales. Abdomen pale grayish white above and below, with scattered brown scales above, forming paired dorsal spots anteriorly in some specimens.

UPPER SURFACE OF WINGS: Forewings with ground color pale grayish white or creamy white, lightly overlain with ochraceous and brown scales; cross lines tending to be parallel with each other, pale ochraceous; t. a. line sharply outwardly oblique in cell, then recurved, with small, inwardly directed tooth on cubital vein, meeting inner margin near base; median line straight, passing just basad to, or including, small, round, brownish black discal spot; t. p. line straight or weakly sinuate, complete, bordered distally by narrow band of ground color and then by

a broader, nebulous ochraceous or ochraceous brown band occupying most of subterminal area; s. t. line of brown or ochraceous brown cellular spots, those in cells R_5 , M_1 , and M_2 variably shaded distally by brown scales; terminal line of brownish black intravenular spots; fringe concolorous with wing. Hind wings concolorous with forewings; median and extradiscal lines present in lower part of wing only, the latter tending to be geminate; discal spot dark brown, small; s. t. and terminal lines, and fringe, like those of forewings.

UNDER SURFACE OF WINGS: Forewings pale grayish white or creamy white, overlain with ochraceous and brown scales except along paler inner margin; hind wings slightly paler; discal spots brownish black, round; cross lines reflected from upper surface.

LENGTH OF FOREWING: 15 to 17 mm.

FEMALE: Similar to male, but with both upper and under surfaces tending to be slightly more heavily overlain with brown scales.

LENGTH OF FOREWING: 17 to 18 mm.

MALE GENITALIA: Uncus triangular in outline, terminating in single, elongate point; socius absent; gnathos slender, with two rounded median lobes separated by distance equal to their own widths; valves without costal swelling and without spine patch; processes of valves symmetrical, slightly shorter than valves, each arising from swollen base, extending as elongate, slender arm, gently curved apically, apical region having numerous, short, dorsal setae; anellus slightly narrowed posteriorly from wide base, posteriorly tapered, sides lightly sclerotized, apically truncate; tegumen broad, tapering, saccus rounded; aedeagus longer than combined lengths of uncus, tegumen, and saccus, with slender, tapering, sclerotized projection posteriorly, and with several longitudinal striations on dorsal surface; vesica with small, lightly sclerotized piece. Abdomen with both sets of tufts on A_3 absent; posterior double comb consisting of nine or 10 modified, well-spaced setae medially on each side, laterally with numerous, closely spaced setae.

FEMALE GENITALIA: Sterigma with lightly sclerotized, subelliptical genital plate, slender and concave anterior to sinus vaginalis, broadening posteriorly; lamella antevaginalis lightly sclerotized, convoluted, lip-like, cover-

ing anterior portion of sinus vaginalis; lamella postvaginalis moderately large, roughly diamond-shaped, posterior margins raised, with small, median, smoothly sclerotized area; ductus bursae elongate, rugose, joining corpus bursae ventrally; corpus bursae faintly rugose adjacent to ductus bursae; signum obsolescent.

TYPE: Schaus gave no indication of the number of specimens in the type series, nor of the type depository, in his original description. The specimen bearing his type label is U.S.N.M. No. 12506, with the male genitalia on a slide labeled "August 1961 E. L. T. 1365." This specimen is hereby designated the lectotype.

TYPE LOCALITY: Castro, Paraná, Brazil.

RANGE: Southern Brazil (the states of Paraná and São Paulo). This species is known only from the northeastern portion of the Humid Subtropical Zone. The time of flight of the adults is not known. (See Appendix for locality data of specimens examined.)

REMARKS: Eight specimens and four genitalic dissections were studied. This species is quite distinct in having the parallel cross lines on a very pale ground color.

The genitalia are also distinctive. In the male the very long and symmetrical processes of the valves are diagnostic, and in the female the diamond-shaped lamella postvaginalis is characteristic.

GROUP II

The coloration of the upper surface of the wings is buff or light brown, variably overlain with ochraceous, darker brown, and olivaceous brown, often producing a mottled effect. The cross lines, in the first two species, are similar to those of group I, while the t. p. and extradiscal line of the next three species are strongly dentate on all wings. In addition, this last subgroup has black scales on vein M_3 in the subterminal area, producing a characteristic dash. This is another group of small-sized species, with wing lengths ranging from 14 to 21 mm. The average size of the species ranges from about 16 to 19 mm.

The male genitalia of each species have a simple uncus, either a broadly bifurcate or a weakly bilobed gnathos, and a moderately sized, weakly constricted anellus. Two of the species have the process of the left valve

longer, two have the right valve more elongate, and one has the processes of equal length. The abdomen has the lateral tufts on A_3 weakly represented or absent.

The female genitalia have a membranous, symmetrical, ovate sterigma. The lamella antevaginalis varies from being a convoluted, lip-like structure covering the anterior portion of the sinus vaginalis, through successive stages of reduction, to being lacking altogether. The lamella postvaginalis is either a large, weakly sclerotized, lobate process or a slender, elongate, apically bifurcate structure. The ductus bursae is variable in length.

The early stages and food plants of all the species in this group are unknown.

Six species are placed in group II. One of these is found in the Humid Subtropical Zone of Brazil and Paraguay, two are found in Bolivia and Peru, one is in Colombia and British Guiana, and the remaining two are in Costa Rica.

Melanolophia striata (W. Warren), new combination

Plate 3, figure 7; text figures 11, 103

Cymatophora striata W. WARREN, 1904, p. 553.

This is a small to moderately sized species that has pale buff or pale ochraceous brown wings, with contrasting brownish black maculation. On the forewings the t. p. line is shaded distally with dark scales, the s. t. and terminal lines are usually complete, and there is a dark area opposite the cell. On the secondaries this pattern of maculation is repeated, being even stronger along the extradiscal line. The males lack the tibial hair pencil on the hind legs. This species occurs in Peru and Bolivia.

MALE: Head, vertex and front pale buff or creamy white, with dark brown or brownish black scales between antennal bases, across top of front, and laterally on each side by eye; palpi pale buff, with sides of basal and median segments largely dark brown or brownish black. Thorax pale buff or creamy white above, with a few scattered brown scales; collar dark brown or grayish brown; patagia and thorax with slender, brownish black transverse band; below creamy white; legs pale buff or creamy white, variably spotted with brown and dark brown scales, hind tibia with-

out hair pencil. Abdomen above creamy white at base, becoming pale buff posteriorly, with scattered brown scales; below mostly creamy white.

UPPER SURFACE OF WINGS: Forewings with ground color creamy white, pale buff, or pale ochraceous brown, with scattered ochraceous, brown, and brownish black scales; cross lines weakly or moderately well represented, dark brown; t. a. and median lines represented by venular dots, on some specimens obsolescent and in others weakly connected by dark scales; discal spot blackish brown, moderate in size; t. p. line obsolescent in middle of wing, in some specimens prominently thickened into blackish spots on veins on distal side, shaded distally with brownish black opposite cell and above inner margin; s. t. line equidistant between apex and origin of t. p. line, represented by blackish or brownish black cellular spots, heavier in upper part of wing and at tornus, shaded distally by blackish brown opposite cell and by brownish black at costa and above tornus; terminal line of prominent, black, intravenular spots; fringe concolorous with wing. Hind wings concolorous with forewings; median line present in lower portion of wing, broadly shaded distally, in some specimens extending as far as small, black discal dot; extradiscal line complete, curved at costa, then extending straight across wing, broadly and prominently shaded distally with brownish black scales; s. t. line, terminal line, and fringe like those on primaries.

UNDER SURFACE OF WINGS: Forewings pale buff, overlain with brown and grayish brown scales except along paler inner margin; hind wings slightly paler; discal spots black or brownish black, prominent or small; maculation reflected from upper side, usually more weakly represented.

LENGTH OF FOREWING: 16 to 19 mm.

FEMALE: Similar to male, but with the upper surfaces of the wings tending to be slightly darker in color. The under side is more heavily overlain with dark scales than that of the male.

LENGTH OF FOREWING: 19 to 21 mm.

MALE GENITALIA: Uncus tapering, sides concave, elongate posteriorly, terminating in single point; socius represented by about four or five setae; gnathos swollen medially, termi-

nating in two large, flattened, rugose projections, separated by broad, U-shaped cleft; each valve with costal swelling; valvula with spine patch very weak or absent; processes of valves of equal size and shape, extending about one-half of length of valves, with narrow, elongate basal section, swelling apically into slightly enlarged apical portion, posterior margin truncate, and having several inwardly directed spines arising dorsally along posterior margin; anellus slightly narrowed medially, strap-like, weakly expanded posteriorly; tegumen with parallel sides, saccus with median lobe anteriorly; aedeagus slightly shorter than combined lengths of uncus, tegumen, and saccus, with tapering, sclerotized projection posteriorly, and with several longitudinal, slightly counterclockwise striations on dorsal surface; vesica unarmed. Abdomen with medioventral set of bristles and both sets of tufts on A_3 absent; posterior double comb consisting of about 10 to 12 modified, well-spaced setae medially on each side, laterally with numerous setae very closely spaced.

FEMALE GENITALIA: Sterigma with lightly sclerotized, ovoid genital plate, widest posteriorly of sinus vaginalis, the latter at base of elongate, funnel-like structure; lamella antevaginalis not differentiated; lamella postvaginalis elongate, narrowed medially, produced posteriorly as two large lobes; ductus bursae very short, slender, joining corpus bursae dorsally; corpus bursae elongate, weakly sclerotized and rugose adjacent to ductus bursae; signum small.

TYPE: Warren described *striata* from two male specimens; the lectotype is hereby designated, and the specimen is in the collection of the British Museum (Natural History).

TYPE LOCALITY: Cerro de Pasco, Huanca-bamba, Peru, 6000 to 10,000 feet.

RANGE: Peru (the departments of Pasco, Piura, Puno, and Cuzco) and Bolivia (the department of Cochabamba). This species is found in the Highlands Zone, with most of the records being on the eastern slope of the Andes Mountains at elevations ranging from 2400 to 7000 feet. It has been captured in February, April, May, June, July, November, and December. (See Appendix for locality data of specimens examined.)

REMARKS: Twenty-three specimens and

eight genitalic dissections were studied. The pale ground color of the wings in this species varies from very pale to light brown, and the t. p., subterminal and terminal lines, with their shadings, stand out in contrast on both the forewings and the hind wings. Males from Bolivia appear to be slightly more brown in color than males from Peru. Until more material becomes available it is not possible to say whether or not this character is of sub-specific value.

The male genitalia are distinguished by the slender uncus, by the large, bifurcate gnathos, and by the fact that the processes of the valves are of equal size and shape. The last have the apical region slightly swollen, the posterior margin truncate, and a group of inwardly directed spines arising posterodorsally. The female genitalia can be distinguished by the fact that the sinus vaginalis is at the base of the funnel-like sterigma, and by the elongate, bifurcate lamella postvaginalis.

***Melanolophia substriata*, new species**

Plate 3, figure 8; text figure 12

This is another small, pale species with poorly defined maculation. In general appearance it resembles a pallid, slightly smaller representation of *striata*, but the tibial hair pencil on the hind legs of the male is present. The most prominent maculation is the black area opposite the cell of the forewing near the outer margin; the t. p. and extradiscal lines are shaded distally with dark scales, so are emphasized. The species occurs in Colombia and British Guiana.

MALE: Head, thorax, and abdomen similar to those of *striata*.

UPPER SURFACE OF WINGS: Forewings with ground color creamy white, more or less heavily overlain with buff or pale ochraceous scales, and with scattered dark brown scales; cross lines weakly represented, brown, similar to those of *striata* as far as can be distinguished; t. p. line extending almost straight across wing, represented by small venular spots and lightly shaded distally by slightly darker scales, especially opposite cell and above inner margin; subterminal and terminal areas very slightly darker than median area; s. t. line with spots enlarged and extended distally by blackish brown scales opposite cell; terminal line of blackish brown,

intravenular spots, in some specimens present only opposite cell. Hind wings concolorous with forewings; median line present in lower part of wing, somewhat nebulous or weakly represented in some specimens; discal spot black, moderate in size; extradiscal line obsolescent at costa, extending straight across remainder of wing, shaded distally with dark brown scales; s. t. and terminal lines like those of primaries, complete; fringe like that of primaries.

UNDER SURFACE OF WINGS: Forewings pale buff, overlain with brown or grayish brown scales except along inner margin; hind wings less heavily overlain with dark scales; discal spots brownish black, small or prominent; maculation weakly reflected from upper surface, with dark scaling in subterminal area most prominent.

LENGTH OF FOREWING: 16 to 17 mm.; holotype, 17 mm.

FEMALE: Similar to male, with maculation slightly better defined and with upper surface of wings slightly more heavily dusted with pale ochraceous scales.

LENGTH OF FOREWING: 18 mm.

MALE GENITALIA: Similar to those of *striata*, differing mainly as follows: socius absent; process of right valve slightly longer than left one, with basal two-thirds gently curved, then constricted, terminally enlarged, with posterior point, distal portion of terminus with numerous thickly set spines arising dorsally and directed toward tip of uncus, the process extending almost to posterior margin of tegumen; process of left valve extending to end of anellus, similar in outline to right process but without constriction, terminal spines arising laterally and dorsally, directed toward gnathos; aedeagus equal in length to combined lengths of uncus, tegumen, and saccus, with tapering sclerotized projection posteriorly, narrowed anteriorly, and with several longitudinal, slightly counterclockwise striations on dorsal surface; vesica unarmed. Abdomen with tufts on A_3 weakly represented; posterior double comb consisting of about 14 or 15 modified, well-spaced setae medially on each side, laterally with numerous setae very closely spaced.

FEMALE GENITALIA: Unknown (the single female examined lacked the abdomen).

TYPES: Holotype, male, "Ob. Rio Negro,"

[Norte de Santander], Colombia, 800 meters (Fassl). Paratypes: Three males, same data as type. A single female, labeled Tumatumari, Rio Potaro, British Guiana, probably belongs to this species, but it has not been designated as a paratype; it is in the collection of the American Museum of Natural History. The holotype and paratypes are in the collection of the British Museum (Natural History).

RANGE: Eastern Colombia (the department of Norte de Santander) and British Guiana. This species occupies the Tropical Wet and Dry Zone, and the two localities where it has been taken are at elevations of approximately 200 and 2600 feet. None of the material studied was dated, so nothing can be said about the time of flight of this species.

REMARKS: Five specimens and two genitalic dissections were studied. As far as can be determined from the limited material available, this species varies somewhat in the color of the upper surface of the wings. There is very little overlay of dark brown or blackish brown scaling, as is found in *striata*, so the pattern of this species is not so contrasting.

The male genitalia are similar to those of *striata*, but those of the present species can be distinguished by the fact that the process of the right valve is longer than that of the left valve, and by the heavier and more densely packed setae at the ends of both processes.

***Melanolophia subatrata* (Dognin),
new combination**

Plate 3, figure 9; text figures 13, 104

Cymatophora ? *subatrata* DOGNIN, 1902, p. 348.

Cymatophora viriditincta W. WARREN, 1906, p. 507. New synonymy.

This is a small, mottled species with a strongly dentate t. p. line and, in many specimens, a prominent s. t. line. The upper surface of the wings is a slightly olivaceous brown. *Melanolophia subatrata* occurs in southeastern South America.

MALE: Head, thorax, and abdomen like those of *umbrosa*.

UPPER SURFACE OF WINGS: Forewings with ground color pale buff, heavily and evenly overlain with ochraceous, dark brown, and olivaceous brown scales and strigations; cross lines weak or obsolescent except for t. p. and s. t. lines; origin of t. a. and median lines marked with black costal spots; discal dot

black, small; t. p. line arising from black costal spot, complete or partly obsolescent, strongly outwardly dentate on veins, with strong basad curve in cell Cu_2 ; subterminal area with blackish brown scales on vein M_3 , and in adjacent cells in some specimens, with small area of white or ground color in outward part of cells M_1 and M_2 ; s. t. line of black or blackish brown cellular spots, narrowly marked with white or light gray distally, less strongly represented in lower part of wing, those in cells M_1 and M_2 shaded distally with dark scaling in most specimens; terminal line of black, intravenular spots; fringe checkered, dark gray or brownish gray, of ground color at vein endings. Hind wings concolorous with forewings; median line represented by broad, dark band; discal spot brownish black, small; extradiscal line complete, outwardly dentate on veins, with strong basad curve in cell M_{1+2} ; subterminal area broad, tending to be slightly darker than basal area in some specimens; s. t. line like that on forewings; terminal line of attenuated black dots; fringe concolorous with wing.

UNDER SURFACE OF WINGS: Forewings pale buff, overlain with grayish black or grayish brown scales except along paler inner margin; hind wings concolorous with forewings, tending to be less heavily overlain with dark scales; discal spots brownish black, small; subterminal band present on wings, reduced on secondaries; most specimens without additional maculation, cross lines weakly indicated in some examples; terminal line and fringes like those on upper surface.

LENGTH OF FOREWING: 14 to 18 mm.

FEMALE: Similar to male, but with mark on vein M_3 and upper part of s. t. line tending to be more strongly represented above. Under surface tending to be more heavily marked with dark scales.

LENGTH OF FOREWING: 15 to 18 mm.

MALE GENITALIA: Uncus tapering, distal portion elongate, narrow, terminating in elongate point; socius represented by from three to six setae; gnathos sharply enlarged medially, extending posteroventrally as elongate, rugose projection, apex truncate or indented medially, concave below; each valve with very prominent costal tubercle and tuft of elongate setae; valvula with anterior sec-

tion of setose ridge enlarged, raised, heavily setose, with small, poorly defined spine patch antieriad thereof; valves with narrow, weakly sclerotized strip extending from sacculus at base of valves to outer portion of setose ridge in valvula; processes of valves asymmetrical, one on right side about two and one-half times as long as that on left; right process arising from broad, hollowed base, terminal four-fifths in form of narrow, free arm, slightly curved, with band of short setae on dorsal surface, extending length of free arm to apex, the process extending almost to apex of uncus; left process extending to posterior portion of anellus, with base similar to right side, and swollen, more heavily sclerotized, slightly shorter terminal piece, spinose dorsally, with a single, very heavy, posteriorly directed spine at inner margin; anellus weakly sclerotized, strap-like, with more heavily sclerotized posterior region, and with irregularly sclerotized transtilla-like process posteriad thereof; tegumen widest posteriorly, saccus U-shaped; aedeagus slightly shorter than, or subequal to, combined lengths of uncus, tegumen, and saccus, with tapering, sclerotized projection posteriorly, and with several longitudinal striations on dorsal surface; vesica unarmed. Abdomen with both sets of tufts on A_3 present, outer ones slightly weaker than inner; posterior double comb consisting of about 10 to 12 modified, well-spaced setae medially on each side, laterally with numerous setae very closely spaced.

FEMALE GENITALIA: Sterigma with large genital plate, varying from subelliptical, slightly wider than long, to subrectangular, slightly longer than wide, anterior margin slender, weakly indented medially, more heavily sclerotized than posterior portion; lamella antevaginalis reduced to small rim anteriorly, widening laterally and extending posteriorly to unite with large, broad lamella postvaginalis, slightly tapering, posterior margin indented medially, in length slightly more than one-half of length of apophyses anteriores; ductus bursae sclerotized and rugose, joining corpus bursae dorsally; corpus bursae moderate to elongate, slightly sclerotized and rugose around ductus bursae; signum absent.

TYPES: Dognin described *subatrata* from a single male specimen (U.S.N.M. No. 32983).

Warren also had a single male specimen before him when he described *viriditincta*; this specimen is U.S.N.M. No. 9359.

TYPE LOCALITIES: "Santa Cruz, Br sil meridional " (*subatrata*); Paraguay (*viriditincta*).

RANGE: Brazil (the states of Minas Gerais, Santa Catarina, and Rio Grande do Sul) and southern Paraguay. This species is found in the Humid Subtropical Zone at low elevations, from about sea level to 1600 feet. Adults have been examined that were captured in every month of the year except March, June, and September. (See Appendix for locality data of specimens examined.)

REMARKS: Twenty-three specimens and 13 genitalic dissections were studied. In appearance, this species is unlike any of the preceding. It is characterized by a faint olivaceous tint in fresh specimens, by the dentate t. p. line, by the strong s. t. line, and by the longitudinal mark on vein M_3 in the subterminal area.

The genitalia of the male are distinctive in having the very long process of the right valve and the raised, setose ridge at the base of the costal tubercle. The females have the large weakly sclerotized sterigma and the prominent lamella postvaginalis.

***Melanolophia inatrata*, new species**

Plate 3, figure 10; text figures 14, 105

This species is quite similar to *subatrata*, but the wings are lighter in color and the maculation tends to be more contrasting. The genitalia are very different from those of *subatrata*. The present species flies in Bolivia and Peru.

MALE: Head, thorax, and abdomen like those of *umbrosa*, or tending to have more pale buff scaling.

UPPER SURFACE OF WINGS: Forewings with ground color pale buff, lightly overlain with ochraceous brown and dark brown scales and strigations; cross lines weakly represented except for t. p. and s. t. lines, as in *subatrata*; subterminal area slightly darker than pale median area, with brownish black scales on vein M_3 and in adjacent cells; s. t. line of black or brownish black cellular spots, narrowly marked with white distally, less strongly represented in lower part of wing but prominent at tornus, those in cells M_1 and M_2

prominently shaded distally with black or brownish black scales; terminal line of black, intravenular spots; fringe concolorous with wings. Hind wings concolorous with forewings; maculation like that of *subatrata*.

UNDER SURFACE OF WINGS: Forewings pale buff, lightly overlain with brown or grayish brown scales except along paler inner margin; hind wings concolorous with forewings but with fewer dark scales; discal spots dark brown, small; subterminal band brownish black, broad, widened on forewings in cells M_1 , M_2 , and M_3 to extend to or near margin, on secondaries extending into cell M_{1+2} as broad band, then absent or obsolescent posteriorly; cross lines weakly indicated in some examples; terminal line like that on upper surface but reduced on secondaries; fringes concolorous with wings.

LENGTH OF FOREWING: 17 to 20 mm.; holotype, 18 mm.

FEMALE: Similar to male. Under surface with more extensive dark scaling and subterminal band.

LENGTH OF FOREWING: 17 to 20 mm. (allotype).

MALE GENITALIA: Uncus tapering, sides concave, apical portion broad, sharply angled ventrally, terminating in elongate point; socius absent; gnathos tapering medially, enlarged into two small, posteroventrally directed points, separated basally by slightly more than their length; each valve with prominent costal tubercle and tuft of elongate setae; valvula with rather poorly defined spine patch; processes of valves asymmetrical, one on left side twice as long as that on right; right process with short, hollowed, basal section, terminal two-thirds straight, bluntly pointed, with narrow band along dorsal surface terminating apically in several short spines, the process terminating before posterior portion of tegumen; left process almost as long as valve, arising from base similar to that on right side, terminal portion very long, slender, gently curving apically, with narrow dorsal band; anellus with rounded base, weakly constricted medially, slightly swollen terminally, and becoming rugose, followed posteriorly by a moderately sclerotized, transtilla-like area; tegumen with strongly developed posterolateral angles,

saccus broadly U-shaped; aedeagus subequal in length to combined lengths of tegumen and saccus, with elongate, tapering, sclerotized projection posteriorly, and with several longitudinal striations on dorsal surface; vesica unarmed. Abdomen with both sets of tufts on A_3 absent; posterior double comb consisting of about nine or 10 modified, well-spaced setae medially on each side, laterally with numerous setae very closely spaced.

FEMALE GENITALIA: Sterigma large, membranous, subovate; lamella antevaginalis in form of convoluted lip across anterior portion of sinus vaginalis; lamella postvaginalis broad, rounded, lobe-like, posterior margin sclerotized except for narrow notch on midline, and with sclerotized, median, anteriorly pointed process; ductus bursae short, rugose, joining corpus bursae dorsally; corpus bursae of moderate length, slightly enlarged anteriorly; signum small.

TYPES: Holotype, male, Region Chapare, [Beni], Bolivia, May 15, 1949, elevation 400 meters; allotype, female, Yungas del Palmar, Bolivia, June, 1951. Paratypes: *Bolivia*: Chapare, [Beni], May 20, 30, 1949, elevation 400 meters, three males; San Ernesto, [La Paz], August–September, elevation 1000 meters (Simons), one male. *Peru*: La Union, R[io] Huacamayo, Carabaya, [Puno], November, December (wet season), 2000 feet (G. Ockenden), five males; Santo Domingo, Carabaya, [Puno], December, elevation 6000 feet (Ockenden), one male; Tarapota, May–August (M. de Mathan), one male. The holotype and allotype are in the collection of the American Museum of Natural History; paratypes are in the collection of the above institution and of the British Museum (Natural History).

RANGE: Bolivia (the departments of Beni and La Paz) and southern Peru (the department of Puno). This species occurs on the eastern slopes of the Andes Mountains at elevations of from about 1300 to 6600 feet. The adults have been captured in May, June, "May–August," "August–September," November, and December.

REMARKS: Thirteen specimens and six genitalic dissections were studied. This species is similar to *subatrata* but can be distinguished by its larger size, by the paler

coloration of the upper surface of the wings, and by the broader, more prominent subterminal band below.

In the male genitalia, *inatrata* differs from *subatrata* in that the uncus is of a different shape, and the process of the left valve is longer than the right. The lamella postvaginalis of the present species is wider and has a well-sclerotized posterior margin, as compared with the tapering, very lightly sclerotized structure of *subatrata*.

***Melanolophia conspicua* Schaus**

Plate 3, figure 11; text figures 15, 106

Melanolophia conspicua SCHAUS, 1911, p. 599.

This taxon is similar to *inatrata*, but it differs in that the upper surface of the wings is paler and the median line is a broad, prominent fascia. The genitalia offer good characters for the recognition of this species. *Melanolophia conspicua* occurs in Costa Rica.

MALE: Head, thorax, and abdomen like those of *inatrata*, but with more pale buff scaling.

UPPER SURFACE OF WINGS: Forewings with ground color pale buff, lightly overlain with ochraceous and dark brown scales; cross lines like those in *inatrata* but with broad blackish brown median band in addition; subterminal area with prominent black bar along vein M_3 and in adjacent cells; s. t. line of more or less continuous black or brownish black spots to cell M_2 , weakly represented posteriorly except for spots at tornus, the line narrowly marked with white distally, spots in cells M_1 and M_2 shaded distally with black or brownish black scales; terminal line of attenuate, black, intravenular spots; fringe checkered, of ground color, dark gray opposite vein endings. Hind wings concolorous with forewings; maculation like that of *inatrata* except for broad median band.

UNDER SURFACE OF WINGS: Forewings pale buff, lightly overlain with light brown or grayish brown scales except along paler inner margin; hind wings concolorous with forewings but with fewer dark scales; discal dots small on primaries, obsolescent on secondaries; subterminal band like that of *inatrata*, with dark bar extending basad on vein M_3 of forewings to t. p. line; cross lines weakly or

moderately well indicated; terminal line reduced or obsolescent; fringes concolorous with wings.

LENGTH OF FOREWING: 18 to 19 mm.

FEMALE: Similar to male. Under surface with more extensive dark scaling and subterminal band.

LENGTH OF FOREWING: 20 mm.

MALE GENITALIA: Similar to those of *inatrata*, differing mainly in the processes of the valves; process of left valve slightly longer than that of right; right process with short, concave basal section, elongate terminal portion straight, bluntly pointed, with narrow spinose band along dorsal surface terminating apically in several spines, the process extending to middle of uncus; left process extending to end of uncus, similar to right process but longer. Posterior double comb on abdomen consisting of about 12 or 14 modified, well-spaced setae medially on each side, laterally with numerous setae very closely spaced.

FEMALE GENITALIA: Similar to those of *inatrata*, differing mainly as follows: lamella postvaginalis elongate, broad, bluntly tapering, with partly sclerotized, median, anteriorly directed process.

TYPE: Schaus described *conspicua* from the male sex, but he did not indicate how many specimens were before him at the time of description. At least two specimens were, for that many localities are mentioned in the original description. U.S.N.M. No. 17463 is hereby designated the lectotype; the male genitalia are on a slide labeled "August 1961, E.L.T. 1366."

TYPE LOCALITY: Juan Vinas, Costa Rica.

RANGE: Costa Rica. This species is known only from the mountains near San José in central Costa Rica. The moths have been captured in May, June, July, and November. (See Appendix for locality data of specimens examined.)

REMARKS: Six specimens and three genitalic dissections were studied. This species shows a close relationship to *inatrata*. The present species can be recognized by the paler, more ochraceous upper surface of the wings, and by the prominent median fascia on all wings.

The male genitalia of *conspicua* are characterized by the fact that the process of the

valves are of approximately the same length, while the female structures have a bluntly pointed lamella postvaginalis with a small median structure.

***Melanolophia fugitaria* Schaus**

Plate 3, figure 12; text figure 107

Melanolophia fugitaria SCHAUS, 1913, p. 348.

This is a pale species with well-defined, non-dentate cross lines and prominent, dark markings in the subterminal and terminal areas opposite the cell. The species occurs in Costa Rica.

MALE: Unknown.

FEMALE: Head, thorax, and abdomen similar to those of *conspicua*.

UPPER SURFACE OF WINGS: Forewings with ground color pale buff, overlain with ochraceous brown and dark brown scales; cross lines complete, non-dentate, dark brown, similar in course to those of *conspicua*; t. a. line strongly curving basad after leaving cell; median line slender, angled above dark discal spot and in cubital cell; t. p. line evenly curved, subparalleling outer margin, tending to be slightly thickened on veins opposite cell; subterminal area broadly suffused with dark brown scales in cells M_1 , M_2 , and M_3 , mixed with ochraceous brown scales in cell M_1 , extending to wing margin in cells M_1 and M_2 ; s. t. line of dark brown spots in upper part of wing, narrowly shaded distally with ground color; terminal area with patch of ground color at apex and in cell M_3 ; terminal line of small, dark, intravenular spots; fringe concolorous with wing. Hind wings concolorous with forewings, with outer portion of median area less heavily overlain with dark scaling; median line heavy, lightly shaded distally with dark scales; discal spot small, black; extradiscal line extending almost straight across wing, weakly angled; s. t. line of dark spots; terminal line of elongate, black marks, filling concave wing margin between veins; fringe of ground color.

UNDER SURFACE OF WINGS: Ground color pale buff or pale grayish buff, overlain with brown and grayish brown scales and strigations; hind wings with fewer dark scales; discal spots present on all wings, those on secondaries larger and darker; cross lines reflected from upper surface, with broad, dark

s. t. band on primaries, becoming narrower posteriorly, continued on secondaries to middle of wing, then appearing as row of spots, with t. p. line arising at inner edge of band near costa.

LENGTH OF FOREWING: 19 mm.

MALE GENITALIA: Unknown.

FEMALE GENITALIA: Similar to those of *conspicua*, differing mainly as follows: sterigma wider, almost round; lamella antevaginalis membranous; lamella postvaginalis short, broad, with median indentation, and with sclerotized median process, anteriorly tapering, joining short ductus bursae; signum very weakly developed.

TYPE: Schaus did not specify the number of specimens in the type series, but stated that the description was based on a female. The specimen bearing the type label is U.S.N.M. No. 17976.

TYPE LOCALITY: Juan Vinas, Costa Rica.

RANGE: Costa Rica. The single known specimen was captured in May. (See Appendix for locality data of specimen examined.)

REMARKS: One specimen and one genitalic dissection were studied. The unique type is somewhat worn but is distinguishable because it has the evenly curved cross lines and the large dark area opposite the cell.

The female genitalia also show a close relationship to those of *conspicua*, and can be distinguished by the tapering, sclerotized process of the lamella postvaginalis.

GROUP III

The upper surface of the wings of the included species varies from a unicolorous dark brown or grayish brown to pale buff, heavily overlain with blackish brown scaling. All the species have more or less straight or slightly curved cross lines, varying from being rather weakly represented to being very prominent. The females of at least five species have shortly pectinate antennae. The adults are larger than those of the two preceding groups, as the length of the forewings varies from 15 to 23 mm., with the average length of the species ranging from about 17.5 to 22 mm.

In the male genitalia, the uncus is either simple, usually slender but broadened in one species, or it has a ventral projection terminally. The gnathos is variably bilobed, and the anellus is moderately constricted medially.

Six of the species have the process of the left valve longer than that of the right valve, five have the opposite condition, while in one species the processes are of almost equal length. The abdomen has the lateral tufts on A_3 weakly represented or absent.

The female genitalia have a membranous or weakly sclerotized, ovate or elliptical, symmetrical sterigma. The lamella antevaginalis may be lip-like, but it is usually absent. The lamella postvaginalis can be a large, weakly sclerotized lobate process, a rounded, more heavily sclerotized projection, or a bifurcate process. The ductus bursae is variable in length; most of the species have an elongate one.

The early stages and food plants of all the species in this group are unknown.

Fourteen species are placed in group III, and two of these are divided into two subspecies each. Thirteen of them occur in South America, either in the Andes Mountains or nearby, with one also being found in Central America. The other species is known only from Central America.

***Melanolophia umbrosa*, new species**

Plate 3, figure 13; text figures 16, 108

This species is about the same size as are *vitta* and *apicalis*, but the upper surface of the wings is considerably darker in color. The cross lines range from being obsolescent to being moderately strong, the median line is often the most prominent, and the t. p. line tends to be shaded with ochraceous. The female antennae are shortly pectinate. The genitalia offer good characters for determination. The moth is known from Bolivia, Peru, and Colombia.

MALE: Head, vertex with mixed grayish brown and brown scales, anteriorly with narrow band of pale buff; front grayish brown, with row of dark brown or brown scales across top and laterally by eyes; palpi brownish gray, with scattered pale buff scales. Thorax pale grayish brown or brownish gray above; patagia slightly lighter in some specimens and with a few dark brown scales medially; below pale buff; legs pale buff, variably spotted with brown scales. Abdomen grayish brown above, with a few scattered brown scales; paler below.

UPPER SURFACE OF WINGS: Forewings

with ground color pale grayish brown, more or less heavily and evenly overlain with brown and with scattered dark brown scales and striations; cross lines weakly represented, medium to dark brown; t. a. line weak or obsolete; median line fairly strong, straight, arising from costal spot in some specimens; discal spot blackish brown, small; t. p. line weak or partially obsolescent, arising from costal spot, ochraceous in some specimens, weakly dentate on veins; s. t. line arising slightly nearer outer margin than to t. p. line, usually represented by small, blackish brown spots in cells M_1 and M_2 , with faint indications of additional spots in some specimens; fringe concolorous with wing. Hind wings concolorous with forewing; median line weak, in some cases obsolescent; discal spot blackish brown, small, in some very small; extradiscal line straight or gently curved, shaded distally near anal margin by broad, nebulous brown band, fading out anteriorly; s. t. line represented at anal angle by dark spots, in some specimens continuing across wing; fringe like that on primaries.

UNDER SURFACE OF WINGS: Forewings grayish brown, evenly sprinkled with brown striations except along inner margin; hind wings slightly paler; discal spots brownish black; otherwise without maculation except for slight darkening in s. t. area of forewings.

LENGTH OF FOREWING: 15 to 20 mm.; holotype, 18 mm.

FEMALE: Similar to male, but with upper surface of wings slightly paler; antennae shortly pectinate.

LENGTH OF FOREWING: 17 to 20 mm.; allotype, 17 mm.

MALE GENITALIA: Uncus tapering, sides slightly convex, terminal portion elongate, sharply curved ventrally and terminating in single point; socius represented by about four to six setae; gnathos broad, constricted medially, both sides terminating in slightly diagonal, flattened, rugose area; each valve with prominent costal swelling; valvula with spine patch; processes of valves asymmetrical, one on left side slightly longer than that on right; right process short, arising from swollen base, becoming more heavily sclerotized distally, slightly constricted beyond middle, increasing in width posteriorly to form swollen apical section having from two to

four elongate setae, innermost heaviest, the process not reaching terminal portion of anellus; left process slightly longer, similar to right process in shape but with area beyond constriction more elongate; anellus with broadly rounded base, only very slightly narrowed medially, and with more heavily sclerotized, rounded posterior region dorsally, posterior to this with weakly sclerotized, transtilla-like process; tegumen broadest posteriorly, saccus U-shaped anteriorly; aedeagus subequal in length to combined lengths of tegumen and saccus, with elongate, tapering, sclerotized projection posteriorly; vesica unarmed. Abdomen with both sets of tufts on A_3 absent; posterior double comb consisting of about nine to 11 modified, well-spaced setae medially on each side.

FEMALE GENITALIA: Sterigma with prominent, oval or elliptical genital plate, becoming reduced posteriorly and posterolaterally; lamella antevaginalis and lamella postvaginalis coalesced, forming lateral, slightly convoluted plates and a raised, elongate, posteriorly directed, median, U-shaped process caudally, with points of process extending beyond rim of sinus vaginalis; ductus bursae elongate, wide, sclerotized, and rugose; joining corpus bursae dorsally; corpus bursae relatively short, weakly rugose posteriorly, slightly swollen anteriorly; signum very small.

TYPES: Holotype, male, Region Chapare, [Beni], Bolivia, April, 1951; allotype, female, Chapare, [Beni], Bolivia, December 12, 1948, elevation 400 meters. Paratypes: *Bolivia*: 54 males and two females, labeled Region Chapare, Chapare, or Chapare district, [Beni], Bolivia, various dates in February, March, April, May, June, July, August, September, and December, 1939, 1946, 1948–1951, elevation 400 meters, some of the specimens labeled as being caught by Peña; Yungas del Palmar, Bolivia, March, 1950, elevation 2000 meters, one male. *Peru*: La Union, R[io] Huacamayo, Carabaya, [Puno], November, December, 1904 (wet season), elevation 2000 feet (G. Ockenden), two males. Also examined, but not included in the type series is one male from Bogota, [Cundinamarca], Colombia. The holotype and the allotype are in the collection of the American Museum of Natural History; paratypes are

in the collections of that institution and of the British Museum (Natural History).

RANGE: Bolivia (the department of Beni), southern Peru (the department of Puno), and Colombia (the department of Cundinamarca). This species is known from the eastern slope of the Andes Mountains at elevations of from about 1300 to 6000 feet. The adults have been captured in every month of the year except January, October, November, and December.

REMARKS: Sixty-two specimens and eight genitalic dissections were studied. The darker coloration of the wings will serve to distinguish this species from the preceding. The single male of *apicalis* from Argentina is about the same color as the series of *umbrosa*, but the present species tends to have a more finely speckled appearance and to have more ochraceous scaling on the cross lines.

A single male from Colombia has been examined. It is paler than specimens from Bolivia and Peru and lacks the ochraceous scaling along the cross lines. In the male genitalia the process of the left valve is longer than that of typical *umbrosa*, as the process extends beyond the posterior margin of the tegumen. Whether or not the above characters represent individual, subspecific, or specific differences will have to be determined when adequate material becomes available.

The male genitalia can be distinguished by the elongate, ventral projection from the uncus, by the simple, rugose gnathos, and by the slightly capitate processes of the valves. The female genitalia can be recognized by the U-shaped process of the lamellae and by the elongate ductus bursae.

***Melanolophia olivescens* (W. Warren),
new combination**

Plate 9, figure 11

Neofidonia olivescens W. WARREN, 1904, p. 555.

Melanolophia olivescens is known only from the unique male type, in the collection of the British Museum (Natural History); the present author has examined a painting of this specimen and a photograph of the genitalia.

This is a moderate-sized species, with relatively dark wings. The cross lines vary from being complete to obsolescent; the t. a. line and the median lines are present, more or less

complete, the t. p. line is obsolescent except for a costal dot, and the s. t. line is represented by several dots opposite the cell. The subterminal area is darkened in the same place. The hind wings are concolorous with the forewings and have a median and an s. t. line. The under surface, according to the original description, has indistinct maculation, small discal dots, and a subterminal band.

The wing expanse was given as 38 mm. by Warren.

The male genitalia have an elongate uncus, a rounded gnathos, the process of the left valve almost twice as long as the one on the right side, and the anellus with the posterior portion more heavily sclerotized than the basal area.

The type locality of *olivescens* is Bulim, Ecuador; the unique type was captured in December, 1900, by Flemming and Miketta.

This species is similar to *umbrosa* in its coloring and obsolescent maculation. In *olivescens* the cross lines are blackish brown, rather than the ochraceous brown found in *umbrosa*, and hence appear more contrasting.

In the male genitalia both *umbrosa* and *olivescens* have a short process on the right valve and a sclerotized terminal portion of the anellus. In *olivescens* the process of the left valve is much longer than that of the right side, while in *umbrosa* the processes are of a more even length.

***Melanolophia tenebrosa* (W. Warren),
new combination**

Plate 3, figures 14, 15; text figures 17, 109

Cymatophora tenebrosa W. WARREN, 1909, p. 100.

Melanolophia (?) *gnamptographa* PROUT, 1910a, p. 341. New synonymy.

In the males, the upper surface of the wings of *tenebrosa* is a dark grayish brown, but the cross lines are about the same as those of *umbrosa*. The females are variable in color above, ranging from a dark grayish brown to pale buff overlain with dark brown. The genitalia offer good characters for the separation of this species. *Melanolophia tenebrosa* is found in Argentina.

MALE: Head, thorax, and abdomen similar to those of *umbrosa*.

UPPER SURFACE OF WINGS: Forewings with ground color grayish brown, evenly overlain with brownish gray and brown scales; cross lines weakly represented, dark brown; t. a. line weak, outwardly oblique into cell, sharply angled posteriorly, concave below cubital vein; median line obsolescent; discal spot brownish black, small; t. p. line straight to about vein M_3 , weakly outwardly curved, then concave to inner margin; s. t. line represented by small blackish brown or brown spots in upper part of wing, obsolescent or absent in middle and lower parts of wing; terminal dots small or obsolescent; fringe concolorous with wing. Hind wings concolorous with forewing; median line absent; discal spot very small or obsolescent; extradiscal line weakly represented in lower part of wing; s. t. and terminal lines absent; fringe like that on primaries.

UNDER SURFACE OF WINGS: Forewings grayish brown, evenly overlain with brownish gray scales except along paler inner margin; hind wings slightly paler, tending to have more brown scaling; most specimens without maculation, rarely with traces of discal dots and cross lines.

LENGTH OF FOREWING: 17 to 20 mm.

FEMALE: Similar to male, but with more variable ground color of wings above, forewings varying from grayish brown to pale buff more or less heavily overlain with brown, brownish gray, or brownish black scaling, with maculation more clearly defined in light-colored specimens, t. p. line tending to be bisinuate, concave in cell and above anal vein. Under surface varying from that similar to male to pale buff overlain with brown scales, and with maculation weakly represented on forewings.

LENGTH OF FOREWING: 15 to 19 mm.

MALE GENITALIA: Uncus tapering, terminal section with parallel sides, rounded apically, with single, ventrally curving point; socius represented by about five to 10 setae; gnathos with broad median area, swollen laterally, the two lobes widely separated and with small median ridge; each valve with prominent costal tubercle and tuft of elongate setae; valvula without spine patch; processes of valves asymmetrical, right one about three times as long as left one; right process with small, broad base, extended pos-

teriorly as elongate arm of even width, slightly curved posteriorly, apex with round, shortly setose processes recessed in semicircular aperture, the process slightly longer than valve; left process reaching posterior margin of anellus, with short, broad base and with longer, bluntly pointed, flat arm; anellus strongly constricted medially from rounded base, broadly enlarged posteriorly; tegumen with parallel sides, saccus U-shaped; aedeagus shorter than combined lengths of uncus, tegumen, and saccus, with slender, tapering, sclerotized projection posteriorly, and with narrowed, capitate anterior end; vesica unarmed. Abdomen with both sets of tufts on A_3 absent; posterior double comb consisting of about eight to 12 modified, well-spaced setae medially on each side, laterally with numerous setae very closely spaced.

FEMALE GENITALIA: Sterigma membranous, sinus vaginalis near bottom of large depression formed by sterigma and posterior margin of abdominal segment; lamella antevaginalis not differentiated; lamella postvaginalis large, tapering, sclerotized, shorter than length of membranous depression; ductus bursae short, weakly sclerotized, with median constriction, joining corpus bursae dorsally in short, rugose arm; corpus bursae elongate; signum absent.

TYPES: The unique female types of both *tenebrosa* and *gnamptographa* are in the collection of the British Museum (Natural History).

TYPE LOCALITIES: Tucuman, Argentina (*tenebrosa* and *gnamptographa*). According to the original descriptions, the former was taken at an elevation of 1100 meters (3608 feet), while the latter was captured at 450 meters (1476 feet).

RANGE: Northern Argentina (the province of Tucuman). The species flies at elevations of from about 1475 to 6575 feet; the only date of capture is January. (See Appendix for locality data of specimens examined.)

REMARKS: Ten specimens and four genitalic dissections were studied. The males of *tenebrosa* have the upper surface of the wings much grayer in color than do those of any of the preceding species. The females are variably dimorphic in this regard, as the color ranges from gray, with rather weakly defined maculation, to a light buff or light brown,

often with distinct markings. The outer margin of the secondaries is not so scalloped as is that of *umbrosa*.

The male genitalia of *tenebrosa* can be separated from those of *umbrosa* by the larger lobes of the gnathos and by the very long process of the right valve.

Melanolophia muscitincta (W. Warren),
new combination

Plate 3, figure 16; text figures 18, 110

Cymatophora muscitincta W. WARREN, 1905, p. 354.

This species is similar to *tenebrosa*, but it is larger, the cross lines are more distinct and straighter, and the female antennae are shortly pectinate. It is found in Peru.

MALE: Head, thorax, and abdomen similar to those of *umbrosa*.

UPPER SURFACE OF WINGS: Forewings with ground color light grayish brown, overlain with brown and brownish gray scales and strigations; cross lines prominent, more or less straight, dark brown, mixed with ochraceous scales in some specimens; t. a. line extending into cell at right angle, or slightly obliquely, to costa, curving and extending straight across wing; median line extending slightly obliquely outward below cubital vein; discal spot brownish black, small; t. p. line straight or slightly sinuous, parallel with median line; s. t. line varying from being obsolescent to being complete, of dark intravenular spots, those in cells M_2 and M_3 enlarged and lightly shaded distally with brownish black; terminal area slightly darker in color than remainder of wing in some specimens; terminal line of dark intravenular spots, decreasing in size posteriorly; fringe concolorous with wing. Hind wings concolorous with forewings; median line prominent, straight or slightly concave; discal spot small, dark; extradiscal line extending straight across wing from cell Sc , shaded distally with brown, becoming geminate and widening posteriorly in some specimens; s. t. line an incomplete row of dark spots; terminal line weak; fringe concolorous with wing.

UNDER SURFACE OF WINGS: Forewings grayish brown, lightly dusted with brown scales except along paler inner margin; costal margin pale buff, with brownish gray scaling; hind wings slightly paler than forewings; dis-

cal spots blackish brown, very small; without maculation except for slight darkening of s. t. area and, in some specimens, with faint indication of cross lines.

LENGTH OF FOREWING: 19 to 21 mm.

FEMALE: Antennae shortly pectinate. Upper surface of wings paler than that in male, less heavily overlain with dark scales, with cross lines tending to be ochraceous and less prominent. Under surface tending to be slightly paler than that of male.

LENGTH OF FOREWING: 20 mm.

MALE GENITALIA: Uncus tapering, with sides slightly concave, terminating in single point; socius absent; gnathos strongly tapering ventrally, produced medially as two elongate, rugose, posteroventrally directed projections, their apices divergent; each valve broad, with prominent costal tubercle and tuft of elongate setae; valvula with small, irregularly shaped, sclerotized patch bearing several long setae; processes of valves asymmetrical, one on right side about twice as long as that on left; right process slender, basal one-third slightly S-shaped, remainder of process a free, slender arm, weakly bi-curved, with apex extending beyond margin of valve, having narrow band of short setae extending up dorsal surface, expanding distally to cover apex of arm, the process almost as long as valve; left process extending as far as posterior portion of anellus, basal one-third convex, terminal portion gradually widening and slightly more heavily sclerotized, with dorsal band of short setae increasing in width posteriorly and projecting beyond apex; anellus with rounded base, slightly constricted medially, enlarged distally into shallowly bilobed, rugose process; tegumen widest posteriorly, saccus U-shaped; aedeagus slightly shorter than combined lengths of uncus, tegumen, and saccus, with slender, tapering, sclerotized projection posteriorly; vesica unarmed. Abdomen with both sets of tufts on A_3 absent; posterior double comb consisting of about 10 to 12 modified, well-spaced setae medially on each side, laterally with numerous setae very closely spaced.

FEMALE GENITALIA: Sterigma large, elliptical, with small, raised, lateral ridge on each side uniting posteriorly; lamella antevaginalis and lamella postvaginalis represented by

sclerotized area at end of ductus bursae, with rounded, raised anterior margin, irregular lateral margins, truncate posteriorly; ductus bursae elongate, rugose, with strong posterior constriction, joining corpus bursae dorsally; corpus bursae elongate, slightly curved anteriorly; signum small.

TYPE: Warren described *muscitincta* from a single female; this specimen is in the collection of the British Museum (Natural History).

TYPE LOCALITY: Santo Domingo, Carabaya, [Puno], Peru.

RANGE: Peru (the departments of Pasco, Cuzco, and Puno). This species occurs in the eastern Andes Mountains at elevations of from about 2800 to 6600 feet, and the adults have been captured in September, October, November, and December. (See Appendix for locality data of specimens examined.)

REMARKS: Six specimens and six genitalic dissections have been studied. The maculation of this species differs from the preceding species of the genus in being clearly defined and consisting of straight lines.

The male genitalia are of the same type as those of the preceding species, and can be recognized by the different shape of the uncus, the fact that the lobes of the gnathos are closer together, and by the longer, spinose process of the left valve.

Melanolophia piura, new species

Plate 3, figure 17; text figure 19

This species is very much like *praeapicata* in appearance, although it is larger, and in it the color of the upper surface of the wings is a darker brown, and the cross lines are more prominent. The male genitalia are distinctive. The species is known from Peru.

MALE: Head, thorax, and abdomen similar to those of *praeapicata* but darker.

UPPER SURFACE OF WINGS: Forewings with ground color light grayish brown, lightly overlain with brown scales, and with broad subterminal and terminal areas suffused with brownish gray; cross lines varying from being obsolescent to being complete, ochraceous brown; t. a. line complete, partially geminate; median line obsolescent, appearing mainly as spots at costa and on cubital vein; discal spot blackish brown, prominent; t. p. line subparallel with outer margin, tending

to be weakly, outwardly dentate on veins, becoming less strongly represented in cubital area, shaded distally with ochraceous scaling and with dark brown scales above inner margin; s. t. line represented by blackish brown spots in cells M_1 , M_2 (largest), and M_3 ; terminal line an incomplete row of dark spots; fringe concolorous with wing, slightly darkened opposite cell. Hind wings concolorous with forewings, with wide area outside extradiscal line darker than basal area; median line weak; discal spot blackish brown, prominent; extradiscal line prominent, extending straight across wing, geminate for most of length; s. t. and terminal lines obsolescent; fringe concolorous with wing.

UNDER SURFACE OF WINGS: Forewings grayish brown, lightly dusted with brownish gray scales except along paler inner margin; costal margin grayish buff, with brownish gray scaling; hind wings concolorous with forewings; discal spots brownish black, prominent; without maculation except for slight darkening of s. t. area on all wings.

LENGTH OF FOREWING: 21 mm. (holotype).

FEMALE: Unknown.

MALE GENITALIA: Uncus triangular, apex flatly rounded, extended ventrally into single, slender point; socius represented by three or four setae; gnathos with two small, rugose, median lobes; each valve broad, with small costal swelling and tuft of elongate setae; valvula with small, diffuse, sclerotized area bearing several setae; processes of valves asymmetrical, one on left side almost twice as long as that on right; right process with broad, weakly sclerotized base, strong median constriction, terminal portion more heavily sclerotized, globular, with dense group of setae arising dorsolaterally, the innermost longer and heavier than others, and with ventral digitate process curving laterally, extending part way between posterior margins of anellus and tegumen; left process extending to posterior portion of uncus, in form of elongate arm, gradually increasing in width posteriorly, with slight constriction near apex, with heavy band of short setae on outer surface of terminal lobe; anellus with rounded base, constricted medially, broadly expanded posteriorly; tegumen with parallel sides, saccus broadly rounded; aedeagus slightly longer than combined lengths of

uncus, tegumen, and saccus, with slender, tapering, sclerotized projection posteriorly; vesica unarmed. Abdomen with both sets of setae on A_3 absent; posterior double comb consisting of about eight or nine modified, well-spaced setae medially on each side, laterally with numerous setae very closely spaced.

FEMALE GENITALIA: Unknown.

TYPE: Holotype, male, Huancabamba, [Piura], Peru. This specimen is in the collection of the United States National Museum.

RANGE: Northwestern Peru (the department of Piura). This species is known only from the unique type specimen.

REMARKS: One specimen and one genitalic dissection have been studied. The maculation of *piura* is very much like that of *praeapicata*, although the cross lines of the forewings are not so straight. The color of the present species is browner than that of *praeapicata*, although it is not so heavily dusted with brown scales.

In the male genitalia, the present species has the apical portion of the uncus more flattened than does *praeapicata*, the process of the left valve does not extend past the end of the uncus, and the process of the right valve has a much heavier group of setae than is found in *praeapicata*.

***Melanolophia producta*, new species**

Plate 3, figure 18; text figure 20

In size, color, and maculation, this species is almost identical with *piura*. The male genitalia of the two species are quite different. *Melanolophia producta* occurs in Ecuador.

MALE: Head, thorax, and abdomen similar to those of *piura*.

UPPER SURFACE OF WINGS: Similar to that of *piura*; forewings with cross lines dull brown, with median line slightly more strongly represented, brownish black; discal dot small, round. Hind wings like those of *piura*, with smaller, round, discal dot; cross lines dull brown.

UNDER SURFACE OF WINGS: Similar to that of *piura*, with forewings slightly more coarsely marked with dark scales, and with cross lines tending to be weakly represented.

LENGTH OF FOREWING: 20 mm. (holotype).

FEMALE: Unknown.

MALE GENITALIA: Uncus triangular, apical region sharply curving ventrad as long, thin process, terminating in single point; socius absent; gnathos tapering medially, with two long, slender, median points, inner margins parallel, their length greater than width at base; valves slender, with small costal swelling and tuft of elongate setae; valvula with small, diffuse, sclerotized area bearing several setae; processes of valves asymmetrical, one on left side slightly longer than that on right; right process with widened, weakly sclerotized base, median portion more strongly sclerotized, slender, of even width, terminally enlarged, with heavy, densely spaced mass of posteromedially directed setae on dorsal surface, occupying almost entire center section of valve, with process extending past middle of uncus; left process extending to posterior margin of uncus, similar in shape to right process but with swollen apical process longer; anellus weakly sclerotized, slightly tapered from wide base, posterolateral margins more heavily sclerotized, extended laterally; tegumen broad, slightly tapering, saccus bluntly pointed; aedeagus shorter than combined lengths of uncus, tegumen, and saccus, with slender, tapering, sclerotized projection posteriorly; vesica unarmed. Abdomen with both sets of setae on A_3 absent; posterior double comb consisting of about nine modified, well-spaced setae medially on each side, laterally with numerous setae very closely spaced.

FEMALE GENITALIA: Unknown.

TYPE: Holotype, male, Balzapamba, Bolivar, Ecuador, March–April, 1894 (M. de Mathan); in the collection of the British Museum (Natural History).

RANGE: Central Ecuador (the province of Bolivar). This species is known only from the unique type specimen.

REMARKS: One specimen and one genitalic dissection were studied. In general appearance this species is almost identical with *piura*. These two species can be easily separated by the male genitalia. In the present species the uncus is very elongate apically, the process of the left valve is only slightly longer than that of the right one, and the two points of the gnathos are long and slender. In *piura*, the uncus is only slightly attenuate apically, the process of the left valve is about

twice as long as the right one, and the points of the gnathos are short.

***Melanolophia vulsa*, new species**

Plate 4, figure 1; text figure 111

This species, known from the female only, is very similar to both *piura* and *producta*, but it is more immaculate. The antennae are moderately pectinate, and the genitalia are distinctive. This species occurs in Colombia.

MALE: Unknown.

FEMALE: Head, thorax, and abdomen similar to those of *piura*; antennae with pectinations of moderate length.

UPPER SURFACE OF WINGS: Similar to that of *piura*; forewings with cross lines obsolescent; discal spot small, brown; s. t. line of dark cellular spots, obsolescent in middle of wing; terminal area with blackish brown patch in cells M_1 and M_2 , extending from near wing margin to enlarged spots of s. t. line, latter shaded distally by V-shaped marks of ground color. Hind wings like those of *piura* but with obsolescent maculation except for prominent s. t. line consisting of dark spots; discal spot small.

UNDER SURFACE OF WINGS: Similar to that of *piura* but more immaculate and slightly darker; discal spots present; s. t. line weakly indicated, widest in upper part of forewing.

LENGTH OF FOREWING: 22 mm. (holotype).

MALE GENITALIA: Unknown.

FEMALE GENITALIA: Sterigma large, rounded, with truncate anterior margin, concave on each side, with ovate, raised, lateral ridge on each side uniting posteriorly; lamella antevaginalis and lamella postvaginalis represented by small, elliptical, sclerotized area occupying posterior one-half of ovate area, with small, anteroventral lip; ductus bursae elongate, broad, finely punctate, joining corpus bursae dorsally, with right side about twice as long as left; corpus bursae elongate, slightly curved anteriorly; signum small.

TYPE: Holotype, female, Sierra del Libane, Colombia, elevation 6000 feet (H. H. Smith); in the collection of the British Museum (Natural History).

RANGE: Colombia, known from the type locality only.

REMARKS: One specimen and one genitalic dissection were studied. This species is closely allied to *piura* and *producta*; exact compari-

sons are difficult, as these two species are known from males only. The present species is more immaculate on both the upper and under surfaces than the two preceding ones, and it has a stronger dark marking opposite the cell by the wing margin on the forewings.

The genitalia can be distinguished from those of the other members of group III by the large sterigmal area and the posterior position of the sclerotized lamella postvaginalis.

It is conceivable that *vulsa* is the female of either *piura* or *producta*, but this is thought to be unlikely. There is too great a difference in the maculation between *vulsa* and the preceding species for them to be conspecific, as far as can be determined from a study of the other species in group III. H. H. Smith, who collected the unique type of *vulsa*, also collected two other species covered in this paper at Sierra del Libane. Both of these, *M. dextera* and *Pherotesia lunata*, prove to be new species and are not known from any other localities. It seems likely that this type of isolated distribution also applies to this species.

Melanolophia limosa (Dognin), new combination

Plate 4, figure 2; text figure 21

Tephrosia limosa DOGNIN, 1895, p. 116.

Melanolophia limosa is very similar to *muscitincta* in size, color, and maculation. The outer margin of the secondaries tends to be less scalloped in the present species, and the cross lines are not so strongly represented. The male genitalia offer excellent characters for the separation of these two species. This taxon occurs in Ecuador.

MALE: Head, thorax, and abdomen similar to those of *muscitincta*.

UPPER SURFACE OF WINGS: Forewings with ground color light grayish brown, overlain with brown and grayish brown scales and strigations; cross lines varying from being weakly represented to prominent, more or less straight, dark brown, similar to those of *muscitincta*; t. a. line extending into cell at angle to costa, sharply angled in cell, with basal bend on cubital vein; median line tending to be weakly represented; discal spot blackish brown, moderate to small in size; t. p. line subparalleling outer margin, tending

to become reduced in middle of wing, slightly thickened opposite cell in some specimens; s. t. line represented in upper part of wing by cellular spots, becoming obsolescent posteriorly; subterminal and terminal areas faintly darker than basal portion of wings in some specimens; terminal line of small, weak dots; fringe concolorous with wing. Hind wings concolorous with forewings; median line weakly represented; discal spot obsolescent; extradiscal line weakly represented anteriorly, straight or slightly curved posteriorly; subterminal and terminal areas slightly darker than basal portion of wing in most specimens; s. t. line represented by a few dots; terminal line obsolescent; fringe like that on primaries.

UNDER SURFACE OF WINGS: Forewings grayish brown, overlain with brownish gray scales except along paler inner margin; costal margin pale buff, with brownish gray scales; hind wings concolorous with, or slightly paler than, forewings; discal spots elongate, brownish gray; most specimens without maculation, some with faint traces of cross lines.

LENGTH OF FOREWING: 16 to 20 mm.

FEMALE: Unknown.

MALE GENITALIA: Uncus tapering, apex curved ventrally, terminating in single point; socius represented by about four to six setae; gnathos with prominent median area, rugose, strongly bilobed, the lobes separated by about twice their width; each valve with prominent costal tubercle and tuft of elongate setae; valvula with prominent, sharply raised ridge bearing numerous, elongate, heavy setae on inner surface; process of valves of equal size and shape, or with right process slightly longer than left one, arising from broad base, strongly constricted medially, with smaller, lobe-like, terminal portion bearing numerous terminal setae, the innermost longest and heaviest, extending to posterior margin of anellus, or slightly beyond; anellus with large rounded base, narrowed posteriorly, slightly enlarged apically; tegumen with parallel sides, saccus U-shaped; aedeagus slightly shorter than combined lengths of uncus, tegumen, and saccus, with slender, tapering, sclerotized projection posteriorly, and with slender, elongate anterior end; vesica unarmed. Abdomen with tufts on A₈ weakly represented or absent; posterior

double comb consisting of about eight to 11 modified, well-spaced setae medially on each side, laterally with numerous setae very closely spaced.

FEMALE GENITALIA: Unknown.

TYPES: Dognin described *limosa* from a series of 19 male specimens. U.S.N.M. No. 32982 is hereby designated as the lectotype; the male genitalia are on a slide labeled "August 1961, E.L.T. 1352."

TYPE LOCALITY: Given as Loja in the original description, but the type and all the cotypes that have been examined are labeled "Environs de Loja," [Loja], Ecuador.

RANGE: Southern Ecuador (the provinces of Loja and Santiago Zamora). As far as can be determined, this species flies at elevations of 3000 to 3500 feet. None of the labels give information as to the months of flight of the moth. (See Appendix for locality data of specimens examined.)

REMARKS: Seventeen specimens and four genitalic dissections were studied. While the color, maculation, and size of *limosa* are very much like those of *muscitincta*, the male genitalia of these two species are quite different. *Melanolophia limosa* can be distinguished from *muscitincta* by the very prominent, heavily setose ridge at the base of the costal tubercle, and by the fact that the processes of the valves are of approximately equal size and configuration.

Melanolophia accurata Prout

Plate 4, figure 3; text figures 22, 112

Melanolophia accurata PROUT, 1910b, p. 509.

This species closely resembles *muscitincta* and *limosa*, and the females have shortly pectinate antennae. The t. a. and t. p. lines tend to be ochraceous, the median line is obsolescent, and the t. p. line is geminate and outwardly dentate on the veins in some specimens. The genitalia offer good diagnostic characters for recognition of the species. It occurs in Colombia.

MALE: Head, thorax, and abdomen similar to those of *limosa*.

UPPER SURFACE OF WINGS: Forewings with ground color light grayish brown, overlain with brown and grayish brown scales; cross lines variable in strength, with median line tending to be obsolescent; t. a. and t. p.

lines brown or ochraceous brown, similar to those of *limosa*; t. a. line leaving costa subparallel with inner margin, sharply bent in cell, angled basad below anal vein, broadly shaded with brown and ochraceous scales in some specimens; median line varying from being obsolescent to being complete, dark brown, angled at costa, tending to be outwardly produced on veins; discal spot blackish brown, small; t. p. line subparalleling outer margin, ochraceous, becoming geminate in lower part of wing in some specimens, dark brown, outwardly produced on veins; s. t. line represented by prominent spots in upper part of wing, by small spots in lower portion of wing; terminal line of small, weak dots; fringe concolorous with wing. Hind wings concolorous with forewings; median line weakly represented; discal spot small or absent; extradiscal line straight or slightly curved, ochraceous, prominent, broadly shaded distally with dark brown in some specimens; subterminal and terminal areas slightly darker than basal portion of wing in many specimens; s. t. line represented by several small dots; terminal line obsolescent; fringe like that on primaries.

UNDER SURFACE OF WINGS: Forewings grayish brown, overlain with brownish gray scales except along paler inner margin; hind wings slightly paler than forewings; discal spots brownish black, small; most specimens without maculation, some with faint trace of subterminal band.

LENGTH OF FOREWING: 19 to 23 mm.

FEMALE: Similar to male (as far as can be determined from the single worn specimen); antennae shortly pectinate.

LENGTH OF FOREWING: 21 mm.

MALE GENITALIA: Uncus tapering, with sides slightly concave, terminating in single, ventrally produced point; socius absent; gnathos in form of band, produced medially into two adjacent, posteriorly directed, apically convergent points; each valve with prominent costal tubercle and tuft of elongate setae; valvula with small, irregularly shaped, sclerotized patch bearing several setae; processes of valves asymmetrical, one on right side slightly longer than that on left; right process with small, rounded base, slender mid-section, gradually swelling apically, with numerous posteriorly directed setae on

dorsal surface, the innermost longest and heaviest, process extending almost to posterior margin of tegumen; left process extending to posterior margin of anellus, with elongate, heavy spine extending beyond that, basally similar to right process, with slender mid-section and small, swollen, terminal portion bearing elongate apical spine, in length equal to mid-section and terminal section of process; anellus with broadly swollen base, slightly narrowed and strap-like medially, becoming slightly more heavily sclerotized posteriorly; tegumen widest posteriorly, with strong posterolateral angles, saccus U-shaped; aedeagus slightly shorter than combined lengths of uncus, tegumen, and saccus, with tapering, sclerotized projection posteriorly; vesica unarmed. Abdomen with both sets of tufts on A_3 absent; posterior double comb consisting of about eight to 11 modified, well-spaced setae medially on each side, laterally with numerous setae very closely spaced.

FEMALE GENITALIA: Sterigma large, membranous, roughly ovate in outline, with small, raised, lateral ridge on each side uniting posteriorly; lamella antevaginalis and lamella postvaginalis represented by small sclerotized area at end of ductus bursae, with rounded, raised, anterior margin and flat, bifurcate, posterior margin; ductus bursae elongate, rugose, with strong posterior constriction, joining corpus bursae dorsally; corpus bursae of moderate length, curved anteriorly; signum small.

TYPE: The unique male type is in the collection of the British Museum (Natural History).

TYPE LOCALITY: San Antonio, near Cali, Valle del Cauca, western Colombia.

RANGE: Colombia (the departments of Norte de Santander, Boyaca, and Valle del Cauca). This species has been taken at elevations of from about 1600 to 7200 feet, during the months of February, March, October, November, and December. (See Appendix for locality data of specimens examined.)

REMARKS: Seventeen specimens and seven genitalic dissections have been studied. The adults of *accurata* appear very similar to those of *muscitincta* and *limosa*. The present species tends to have the t. a., t. p., and extradiscal lines broadly shaded with brown in some specimens.

The single female studied had been damaged at one time, and some of the wings have been glued on the thorax. This specimen has shortly pectinate antennae (or, strictly speaking, one antenna, as the other is missing), with the pectinations about one-half as long as those in the male. It is not certain that the head is the original head of this specimen, as it too may have been glued on.

The male genitalia are more like those of *muscitincta* than those of *limosa*. The processes of the valves are quite different in these two species, so that they cannot be confused.

The female genitalia are of the same type as are those of *praeapicata*, with the largely membranous sterigma and the small sclerotized lamellae. In *accurata* the sterigma is less differentiated, and the posterior margin of the lamellae is bifurcate.

***Melanolophia rubrica*, new species**

Plate 4, figure 4; text figure 113

This is a moderate-sized species, known from the female only, with a faint reddish brown tint to the upper surface. The antennae are shortly pectinate in this taxon; the t. p. line is angled below the costa and is then straight. The genitalia are of the same type as are those of *accurata*. The present species is known from Guatemala.

MALE: Unknown.

FEMALE: Head with shortly pectinate antennae; head, thorax, and abdomen similar to those of *accurata* but paler.

UPPER SURFACE OF WINGS: Forewings with ground color light buff, lightly overlain with reddish brown scales; maculation reddish brown; cross lines variable in strength, t. p. line strongest; t. a. line extending obliquely outward into cell, then angled posteriorly and crossing wing; median line outwardly curved into cell, then subparalleling t. a. line; t. p. line extending obliquely outward, angled posteriorly at vein M_1 , then proceeding straight across wing, weakly geminate opposite cell and above inner margin; s. t. line an incomplete row of spots, shaded distally with ground color in upper part of wing; subterminal and terminal areas shaded with large, triangular area in cells R_4 to M_2 , narrowed basally, extending to t. p. line; terminal line of small dots; fringe concolorous with wing. Hind wings concolorous with fore-

wings; middle one-third of wing broadly suffused with dark brown, extending from median line, followed by narrow band of ground color and extradiscal line, weakly dentate on veins; s. t. line of several round dots; terminal line tending to be complete, interrupted by paler veins; fringe like that on primaries.

UNDER SURFACE OF WINGS: Forewings pale grayish buff, lightly overlain with grayish brown scales except along paler inner margin; hind wings slightly paler than forewings; maculation absent except for very small discal spots, faint trace of s. t. band on upper part of forewings, and terminal line.

LENGTH OF FOREWING: 19 mm. (holotype).

MALE GENITALIA: Unknown.

FEMALE GENITALIA: Sterigma large, membranous, slightly widened posteriorly; lamella antevaginalis absent; lamella postvaginalis in form of raised, membranous ridge, posteriorly with two longitudinal, lightly sclerotized processes; ductus bursae elongate, rugose, joining corpus bursae dorsally; corpus bursae of moderate length, curved and slightly enlarged anteriorly; signum small.

TYPE: Holotype, female, Cayuga, Guatemala, May (Schaus and Barnes); in the collection of the United States National Museum.

RANGE: Guatemala. The unique type was taken near the Caribbean Sea at low elevations in the month of May.

REMARKS: One specimen and one genitalic dissection were studied. The type is somewhat rubbed, so complete details of its color and maculation must await adequate material. Its exact relationships must also await a study of the male and its genitalia.

This species can be recognized by the reddish brown coloration of the upper surface, with the angled cross lines, and by the almost immaculate under side.

The female genitalia are of the same general type as are those of *accurata*, with the membranous sterigma; the present species can be separated by the membranous median ridge of the lamella postvaginalis, with the paired posterior processes.

***Melanolophia eudoxa*, new species**

This is a moderately large species, with more or less contrasting maculation and with the t. a. and t. p. lines tending to be straight

and parallel. It occurs in two subspecific populations: one in Bolivia and Peru, the other in Colombia and Venezuela.

***Melanolophia eudoxa eudoxa*, new subspecies**

Plate 4, figure 5; text figures 23, 114

The nominate subspecies is contrastingly colored on the upper surface. It occurs in Bolivia and Peru.

MALE: Head, vertex brownish gray, with pale buff scales around edges; front pale gray or ochraceous brown, upper portion and sides dark brown; palpi brownish gray, pale buff scales at base of first segment and at end of second segment. Thorax with mixed pale buff and brownish gray scales above, narrow blackish brown transverse bar on middle of patagia and continued across thorax; below pale buff; legs pale buff, variably spotted with grayish brown and dark brown scales. Abdomen with mixed pale buff and brownish gray scales above, paler at base, apically and below.

UPPER SURFACE OF WINGS: Forewings with ground color pale buff or grayish buff, overlain with ochraceous and brown scales; cross lines usually prominent, dark brown; t. a. line geminate, going obliquely outward to cell, sharply angled, then straight to inner margin; median line weak in some specimens, adjacent to or touching moderate black or blackish brown discal spot, nearer to t. a. line anteriorly but nearer to t. p. line posteriorly, shaded distally in lower portion of wing by nebulous brown shade line; dark brown scales along lower margin of cell in some specimens between t. a. or median and t. p. lines; t. p. line prominent, slightly concave in lower part of wing, parallel with t. a. line, followed by narrow band of ground color and broader band of dark brown, outwardly dentate on veins, very strongly so in some specimens; subterminal area of ground color; s. t. line more or less complete, some of spots shaded outwardly by ground color or grayish white, spots in cells M_1 and M_2 shaded distally to outer margin with dark brown; fringe concolorous with wing. Hind wings concolorous with forewings; median line obsolescent in upper part of wing, shaded distally in lower portion of wing by nebulous dark brown area in some specimens; discal spot blackish brown, smaller than on forewings; extradiscal line

straight or slightly concave in lower part of wing, geminate for most of length; s. t. line preceded by narrow band of ground color, the line itself represented by four or five blackish brown spots; fringe like that on forewings.

UNDER SURFACE OF WINGS: Pale buff or grayish buff, with maculation of upper surface repeated, although usually not so heavily as on upper surface; apex of forewing with area of pure ground color.

LENGTH OF FOREWING: 19 to 22 mm.; holotype, 22 mm.

FEMALE: Similar to male, but with maculation of both upper and under surfaces tending to be more weakly represented.

LENGTH OF FOREWING: 22 mm. (allotype).

MALE GENITALIA: Uncus tapering from wide base, sides concave, apically with single point; socius absent; gnathos tapering ventrally, medially produced as two closely approximated, pointed, posteriorly directed points; each valve with very prominent costal tubercle and tuft of elongate setae; valvula without spine patch but with small, slightly raised area with three or four elongate setae; processes of valves asymmetrical, one on left side slightly longer than that on right; right process arising from wide base, terminal two-thirds narrow, somewhat flattened, with band of elongate spines arising from inner surface and extending beyond apex, the process extending as far as anterior margin of gnathos; left process extending beyond base of gnathos, similar to right process but with terminal portion more elongate and slightly more curved, and with band of spines tending to be slightly wider and with spines slightly longer; anellus with broadly rounded base, slightly narrowed and constricted medially, slightly swollen apically; tegumen widest posteriorly, with very prominent posterodistal and median projections, saccus with parallel sides, broadly U-shaped; aedeagus longer than combined lengths of tegumen and saccus, with narrow, elongate, curved, sclerotized projection posteriorly on right side, and with several longitudinal striations on surface; vesica unarmed. Abdomen with both sets of tufts on A_3 present, outer ones weaker than inner; posterior double comb consisting of about 12 to 14 modified, well-spaced setae medially on each side, laterally with numerous setae very closely spaced.

FEMALE GENITALIA: Sterigma with prominent, circular or elliptical, rather small genital plate, with sinus vaginalis situated in center; lamella antevaginalis flap-like, convoluted, covering about one-half of sinus vaginalis; lamella postvaginalis raised, broad, rugose, evenly rounded terminally, with small, more heavily sclerotized piece in opening of sinus vaginalis; ductus bursae sclerotized and rugose, joining corpus bursae dorsally; corpus bursae elongate, weakly rugose anterior to junction with ductus bursae; signum very small.

TYPES: Holotype, male, Chapare, [Beni], Bolivia, August 28, 1949 (Peña); allotype, female, Yungas del Palmar, Bolivia, April 10, 1950, elevation 2000 meters. Paratypes: *Bolivia*: Same data as holotype, August 15, 23, 1949, December 7, 8, 1949, elevation 400 meters, four males; same data as allotype, March, 1950, one male. *Peru*: Coosnipata, Paucartambo, Cuzco, November 29, 1951 (F. L. Woytkowski), two males; Chanchamayo, [Pasco] (Schunke), one male. The holotype and allotype are in the collection of the American Museum of Natural History; paratypes are in the collections of the American Museum of Natural History and of the British Museum (Natural History).

RANGE: Bolivia (the department of Beni) and Peru (the departments of Cuzco and Pasco). This population occurs on the eastern fringe of the Andes Mountains at elevations of from about 1300 to 6600 feet. The adults have been captured in February, March, April, August, and December.

REMARKS: Ten specimens and five genitalic dissections were studied. Freshly emerged specimens are quite contrasting in the coloration of the upper surface of the wings, but older specimens tend to become somewhat washed out in appearance.

The genitalia of *eudoxa* are of the same type as are those of the preceding species. The males can be recognized by the long row of spines on the inner margins of both processes, and the females by the large, rounded lamella postvaginalis.

***Melanolophia eudoxa simpla*, new subspecies**

Plate 4, figure 6

The second subspecies occurs in Colombia and Venezuela, and it is distinguished by the

less contrastingly colored upper surface of the wings. Genitalic differences are present between these two populations.

MALE: Head, thorax, and abdomen like those of nominate subspecies.

UPPER SURFACE OF WINGS: Forewings with ground color pale buff or ochraceous buff, heavily overlain with ochraceous and dark brown scales; cross lines and maculation like those of nominate subspecies but less contrasting. Hind wings like those of nominate subspecies, with extradiscal line more strongly geminate.

UNDER SURFACE OF WINGS: Similar to that of nominate population but tending to be less contrastingly marked.

LENGTH OF FOREWING: 21 mm. (holotype).

FEMALE: Similar to that of nominate subspecies, but tending to be slightly darker and less contrastingly marked above and below.

LENGTH OF FOREWING: 20 to 21 mm.; allotype, 21 mm.

MALE GENITALIA: Similar to those of nominate subspecies but larger and differing mainly as follows: uncus with terminal portion wider, apex bluntly rounded; gnathos with median points broader; processes of valves slightly longer and wider, with process of right valve extending to posterior margin of base of gnathos, left process to middle of valve. Posterior double comb with about 10 modified, well-spaced setae medially on each side, laterally with numerous setae very closely spaced.

FEMALE GENITALIA: Similar to those of nominate subspecies but slightly larger.

TYPES: Holotype, male, "Cañon del Tolima, Cent. Cord.," [Tolima], Colombia, elevation 1700 meters (Fassl); allotype, female, "Pacho, Ost. Cord.," [Cundinamarca], Colombia, elevation 2200 meters (Fassl). Paratype: Venezuela, 1901 (Fouillon), one female. The holotype, allotype, and paratype are in the collection of the United States National Museum.

RANGE: Colombia (the departments of Tolima and Cundinamarca) and Venezuela. In Colombia this taxon has been captured in both the Cordillera Central and the Cordillera Oriental, at elevations of about 5600 and 7200 feet. None of the material studied carried dates of capture.

REMARKS: Three specimens and three

genitalic dissections were studied. This population is more ochraceous, with less contrasting maculation, than the nominate population. This fact, together with the male genitalic differences, might indicate that the present taxon should be given specific rank. However, it is thought advisable to place *simpla* as a subspecies, as the differences between these two populations are not so great as those between the following species.

Melanolophia trisurca (Dognin), new combination

Tephrosia trisurca DOGNIN, 1895, p. 114.

This species is very similar to *eudoxa*. The genitalia should be used to separate the two species. *Melanolophia trisurca* occurs in two subspecific populations: one in Ecuador, and the other in Peru and Bolivia.

Melanolophia trisurca trisurca (Dognin)

Plate 4, figure 7; text figures 25, 115

Tephrosia trisurca DOGNIN, 1895, p. 114.

This population appears to be slightly larger than the more southerly subspecies. Genitalic differences are present in the male for the separation of these two populations. This subspecies is known from southern Ecuador.

MALE: Head, thorax, and abdomen similar to those of *eudoxa*.

UPPER SURFACE OF WINGS: Forewings like those of *eudoxa*, but with t. a. and t. p. lines more strongly geminate, the latter with outer line attenuated distally on veins; discal spot large, black; s. t. line of confluent spots anteriorly, obsolescent below middle of wing, prominent at tornus, and broadly shaded distally with brownish black opposite cell. Hind wings like those of *eudoxa*.

UNDER SURFACE OF WINGS: Similar to that of *eudoxa*.

LENGTH OF FOREWING: 23 mm.

FEMALE: Similar to male, but with cross lines tending to be more clearly defined above.

LENGTH OF FOREWING: 22 mm.

MALE GENITALIA: Similar to those of *eudoxa*, differing mainly as follows: uncus and gnathos intermediate in size and shape between those of *e. eudoxa* and those of *e. simpla*; processes of valves asymmetrical, one on right side longer than that on left; right process arising from broad, weakly sclerotized

base, terminal two-thirds narrow, with terminal portion enlarged, angled medially, and having numerous short setae on dorsal surface, the process extending to basal part of uncus; left process extending to posterior margin of anellus, basal section as on right side, with short arm posteriorly, with long, curved spine arising distally, extending as far as posterior margin of tegumen, and with second, smaller spine at base of large one; aedeagus equal to combined lengths of uncus, tegumen, and saccus, with elongate, tapering, sclerotized projection posteriorly.

FEMALE GENITALIA: Similar to those of *eudoxa*, differing mainly as follows: sterigma with prominent, elliptical genital plate, with anterior margin smaller than posterior section; lamella postvaginalis raised, broad, slightly tapered anteriorly, with posterior median cleft.

TYPE: Dognin described *trisurca* from a single female specimen; it is U.S.N.M. No. 32984.

TYPE LOCALITY: "Environs de Loja," [Loja], Ecuador.

RANGE: Southern Ecuador (the province of Loja). (See Appendix for locality data of specimens examined.)

REMARKS: Two specimens and two genitalic dissections were studied. In appearance this species is almost identical with *eudoxa*, and the genitalia should be examined for the determination. In the male, *trisurca* can be distinguished by the smaller and less setose processes of the valves, as compared with those of *eudoxa*. In the female the present species has a narrower anterior margin of the sterigma and lacks the small median process of the lamella postvaginalis.

The genitalia of this population are quite similar to those of *accurata*. The present species has a longer median section to the process of the right valve, and lacks the processes of the lamella postvaginalis as compared with *accurata*.

Melanolophia trisurca elongata, new subspecies
Plate 4, figure 8; text figure 24

This population is very similar to the nominate one, and the genitalia of the males can be used to separate the two. The present subspecies occurs in Peru and Bolivia.

MALE: Head, thorax, and abdomen similar to those of *t. trisurca*.

UPPER SURFACE OF WINGS: Similar to that of *t. trisurca* but tending to be slightly more heavily suffused with brown scales, and with discal spot of forewings smaller.

UNDER SURFACE OF WINGS: Similar to that of *t. trisurca* but tending to be less heavily suffused with brown scales, and with discal spot of forewings smaller.

UNDER SURFACE OF WINGS: Similar to that of *t. trisurca* but tending to be less heavily suffused with brown scales.

LENGTH OF FOREWING: 20 to 23 mm.; holotype, 21 mm.

FEMALE: Unknown.

MALE GENITALIA: Similar to those of *t. trisurca*, differing mainly as follows: uncus with terminal portion slightly broader; process of right valve more strongly sclerotized, curving terminally into slightly smaller, more setose apical portion, the process extending to middle of uncus; process of left valve longer, extending to posterior margin of tegumen, distal portion more strongly sclerotized, outer margin concave and with band of fine setae, terminating apically, with single, large, inwardly curving spine near apex of process.

FEMALE GENITALIA: Unknown.

TYPES: Holotype, male, Incachaca, Cochabamba, Bolivia (J. Steinbach). Paratypes: *Bolivia:* Chaco, three males; no further data, two males. *Peru:* Huancabamba, [Piura], three males; Chachapoyas, Amazonas (M. de Mathan), one male. No further data, four males. The holotype and paratypes are in the collection of the United States National Museum.

RANGE: Peru (the departments of Piura and Amazonas) and Bolivia (the department of Cochabamba). This population has been taken at elevations of about 6500 to 7600 feet.

REMARKS: Fourteen specimens and four genitalic dissections were studied. This population is slightly smaller and darker than the nominate subspecies. Some of the specimens from Bolivia tend to be smaller and darker than the Peruvian examples.

In the male genitalia, the processes of the valves are more heavily sclerotized and longer than those of *t. trisurca*. The preparations of Bolivian specimens indicate that the process

of the left valve is slightly longer than the one in Peruvian males.

Melanolophia munda (W. Warren),
new combination

Plate 4, figure 9; text figure 26

Cymatophora munda W. WARREN, 1907, p. 275.

This is a large species having the median areas of the wings above lighter in color than the surrounding portions, although the cross lines and male genitalia show a close relationship to *eudoxa*. This moth is known from Peru.

MALE: Head, vertex, front, and palpi with mixed buff and brown scales. Thorax above, collar, and patagia with mixed pale buff and brown scales; below buff; legs buff or pale buff, with many brown scales. Abdomen above with mixed buff and brown scales; paler below.

UPPER SURFACE OF WINGS: Forewings with ground color pale buff, basal and outer areas heavily and evenly overlain with grayish brown and brown scales, median area lightly overlain with ochraceous brown and brown scales; cross lines brown, narrow, fairly straight; t. a. line going obliquely outward to cell, sharply angled, then proceeding straight to inner margin; median line nebulous, slightly S-shaped, situated in basal part of pale median area, shaded distally in lower part of wing by brown scales, appearing broadly geminate; discal spot brownish black, small; t. p. line slightly convex opposite discal spot, otherwise straight, weakly shaded distally with brown scales opposite cell and above inner margin; s. t. line represented by inconspicuous spots in upper part of wing, those in cells R_5 , M_1 , and M_2 tending to be narrowly shaded distally with ground color; terminal line absent; fringe concolorous with wing basally, lighter colored distally. Hind wings with basal and median areas concolorous with median area of forewing, subterminal and terminal areas concolorous with same areas of forewing; median line nebulous, broad, represented in lower part of wing; discal spot, extradiscal, s. t., and terminal lines, and fringe, similar to those of forewing.

UNDER SURFACE OF WINGS: Forewings pale buff, heavily overlain with dark brown scales, particularly outside t. p. line, except for paler

inner margin and apex of wing; hind wings concolorous with forewings; discal spots small, present on all wings, t. p. and extradiscal lines reflected from upper surface, otherwise without maculation; terminal lines absent; fringes concolorous with wings.

LENGTH OF FOREWING: 22 mm.

FEMALE: Unknown.

MALE GENITALIA: Similar to those of *eudoxa*, differing mainly as follows; gnathos with median section small, bilobed, concave below; valves with small costal tubercle and tuft of elongate setae, and with sclerotized strip in valvula; processes of valves asymmetrical, left one longer than right; right process short, arising from broad base, extending as arm, slightly longer than length of base, slightly swollen near end, with single prominent spine on inner side, apical portion more membranous, rounded, bearing several small setae, the process extending to posterior margin of anellus; left process extending to posterior margin of tegumen, arising from broad base, extending as well-sclerotized arm, tapering apically, bearing numerous spines on dorsal and inner surfaces; aedeagus with very long, slender, curving, sclerotized projection posteriorly.

FEMALE GENITALIA: Unknown.

TYPE: Warren described *munda* from a single male; this specimen is in the collection of the British Museum (Natural History).

TYPE LOCALITY: Cushi, Huánuco, Peru.

RANGE: Peru (the department of Huánuco). The species is known only from the type locality, at an elevation of about 6200 feet. The time of flight is not known. (See Appendix for locality data of specimen examined.)

REMARKS: One specimen and one genitalic dissection were studied. The upper surface of the wings appears, at first glance, to be quite unlike that of the other species of this group. The pattern is simple, and it is set off by the contrasting color of the median area. However, the maculation is almost exactly the same as that of *eudoxa*; in the latter species the pattern is complicated by geminate cross lines and by the ground color that appears in the subterminal area.

The male genitalia also show a close relationship to those of *eudoxa*. In *munda*, the

processes of the valves are different, and the right one is shorter and simpler than that of *eudoxa*.

Melanolophia vegranda, new species

Plate 4, figure 10; text figure 27

This is a relatively small species, heavily shaded with blackish brown scaling, which somewhat resembles *striata* of group II and *trisurca* of the present group. The male genitalia indicate that *vegranda* should be placed in group III. This taxon is known from Ecuador and Costa Rica.

MALE: Head, thorax, and abdomen similar to those of *trisurca*.

UPPER SURFACE OF WINGS: Forewings similar to those of *trisurca* but with t. p. line more evenly curved, subparalleling outer margin, smooth (holotype) or dentate on veins (paratype), spots of s. t. line shaded distally with white. Hind wings more contrastingly marked than those of *trisurca*, basal and median areas pale buff, broadly geminate median line brownish black, extradiscal line broadly shaded distally with blackish brown.

UNDER SURFACE OF WINGS: Similar to that of *trisurca*, with discal spots present on all wings.

LENGTH OF FOREWING: 17 (holotype) to 18 mm.

FEMALE: Unknown.

MALE GENITALIA: Uncus tapering, slightly swollen medially, terminating in single, ventrally produced point; socius absent; gnathos tapering ventrally, medially produced as two rounded, posteriorly directed points, separated by short space (holotype) or adjacent (paratype); each valve with costal tubercle and tuft of elongate setae; valvula without spine patch; processes of valves asymmetrical, one on right side longer than that on left; right process arising from wide, elongate, lightly sclerotized base, with more heavily sclerotized distal arm, weakly constricted medially, enlarged apically, ovate, postero-medially directed, with dorsal surface thickly covered with setae and extending beyond apex, the process extending to base of uncus; left process extending to posterior margin of anellus, basal section similar to that of right

side but slightly shorter, then angled postero-medially as lobate process, with dorsal surface thickly covered with short setae, and with small digitate process from outer angle of lobate process, with single terminal seta; anellus slightly narrowed medially, swollen apically, distal margin rounded, sclerotized; tegumen widest posteriorly, with strong posterodistal and median projections, saccus U-shaped; aedeagus shorter than combined lengths of uncus, tegumen, and saccus, with narrow, elongate, curved, sclerotized projection posteriorly on left side, and with several longitudinal striations on dorsal surface; vesica unarmed. Abdomen with both sets of tufts on A₃ absent; posterior double comb consisting of about 10 to 12 modified, well-spaced setae medially on each side, laterally with numerous setae very closely spaced.

FEMALE GENITALIA: Unknown.

TYPES: Holotype, male, Balzapamba, Bolivar, Ecuador, September, 1893, to February, 1894 (M. de Mathan). Paratype: Costa Rica: Cachi (Lankester). Both specimens are in the collection of the British Museum (Natural History).

RANGE: Ecuador (the province of Bolivar) and Costa Rica. These two localities are at approximately 2060 and 3300 feet in elevation. The only date of capture is the period between September and February.

REMARKS: Two specimens and two genital dissections were studied. This species is one of the smallest of group III and, in maculation, it somewhat resembles a very dark *striata*. It is more closely allied to *trisurca* and can be distinguished from that much larger species by the smoothly curving t. p. line.

Several differences are present in the two specimens examined. The type has a smoothly curving t. p. line, prominently shaded distally with blackish brown; the paratype has a broad, somewhat geminate median line, and a dentate t. p. line which lacks the heavy distal shading. Differences of this magnitude are present within the subspecific populations of nominate *trisurca*. Whether they will prove to be of subspecific or of individual rank in this species will have to await a study of adequate material.

The male genitalia are distinguished by the

shape and length of the processes of the valves. Small differences are present between the two dissections in the shape of the gnathos and of the valvular processes.

GROUP IV

The members of this group have pale buff wings above, more or less lightly overlain with brown scales. The cross lines are usually rather weakly represented and, with one exception, are curved and of the basic pattern. The exception is a species that greatly resembles some members of group III, but is placed here on genitalic characters. In wing length, the members of this group are mostly small or of medium size, with the length of the forewings varying from 14 to 23 mm.; the average length of the wings ranges from 16 to almost 20 mm.

The male genitalia of all species have a simple, slender uncus, although in one species the uncus is somewhat thickened. The gnathos is variable, ranging from a rounded projection to being broadly bifurcate, or asymmetrically bilobed or trilobed. The anellus tends to be elongate and weakly constricted medially. One of the species has the processes of the valves of equal length and symmetrical, another has the process on the right side longer, while the remaining five species have the left process more elongate. Two of the species have the hair pencils on A_3 weakly represented, while the other five species have well-developed hair pencils, the outer one arising from a lobate sack-like process.

In the female genitalia the sterigma is usually poorly developed and membranous. The lamella antevaginalis is reduced or absent except in one species, which has a lobed process. The lamella postvaginalis varies from a pair of small lobes to an elongate, apically bifurcate, strongly sclerotized process. The ductus bursae is short or moderate in length, and it is sclerotized.

The early stages and food plants of all the species in this group are unknown.

Seven species are placed in group IV, and one of these is subdivided into two subspecies. The species range from Mexico (one species) to Costa Rica (one species), and through Panama to Colombia (one species); another

occurs in Panama, with a closely allied species in Venezuela; the remaining ones occur in Ecuador, Peru, and Bolivia, and then in Brazil.

Melanolophia perversa, new species

Plate 4, figure 11; text figures 28, 116

The males of this species are smaller than, but otherwise similar to, the members of the preceding two species. The females tend to have obsolescent maculation. The genitalia of both sexes are distinctive. This taxon occurs in southeastern Brazil.

MALE: Head, thorax, and abdomen similar to those of *eudoxa*.

UPPER SURFACE OF WINGS: Forewings with ground color pale buff, more or less heavily overlain with ochraceous brown and dark brown scales; maculation like that of *eudoxa* but less clearly defined; s. t. line tending to be completely represented. Hind wings similar to forewings, with maculation like that of *eudoxa*.

UNDER SURFACE OF WINGS: Similar to that of *eudoxa*.

LENGTH OF FOREWING: 18 to 20 mm.; holotype, 19 mm.

FEMALE: Similar to male, but with upper and under surfaces of wings heavily overlain with brown scales, with maculation obsolescent except for discal dots and traces of cross lines above.

LENGTH OF FOREWING: 18 to 23 mm.; allotype, 18 mm.

MALE GENITALIA: Uncus with attenuated base, tapering distally, with bluntly pointed apex and single point; socius absent; gnathos very elongate dorsally, tapering ventrally, with very long, tapering, posteriorly directed, mid-line projection terminating in two small points, right being shorter than left; each valve with very prominent costal tubercle and tuft of elongate setae; valvula without spine patch; processes of valves asymmetrical, one on left side slightly longer than one on right; right process a sinuate, sclerotized strip, slightly swollen apically, extending as far as anterior margin of gnathos; left process extending to middle of gnathos, arising from rounded, swollen base, with small swollen area having minute projection posteriorly

and an elongate, free, tubular, narrow, sclerotized arm arising posterodistally; anellus with broadly rounded base, gradually tapering posteriorly to form strap-like process; tegumen broad posteriorly, with elongate posterodistal projections, and with short, tapering saccus; aedeagus shorter than combined lengths of uncus, tegumen, and saccus, with an elongate, curved, sclerotized projection posteriorly on right side, and with several longitudinal striations on surface; vesica unarmed. Abdomen with both sets of tufts on A_3 weakly represented or absent; posterior double comb consisting of about 10 to 12 modified, well-spaced setae medially on each side, laterally with numerous setae very closely spaced.

FEMALE GENITALIA: Sterigma without prominent genital plate, sinus vaginalis surrounded by small, membranous structure; lamella antevaginalis absent, or fused with ductus bursae; lamella postvaginalis a semi-circular thickening in dorsal wall of ductus bursae, with small median indentation; ductus bursae heavily sclerotized posteriorly, large, slightly longer than wide, with both ends slightly tapered, becoming rugose and more slender anteriorly, joining corpus bursae ventrally; corpus bursae elongate; signum very small.

TYPES: Holotype, male, Nuevo Teutonia, [Santa Catarina], Brazil, May 26, 1952 (F. Plaumann); allotype, female, same data, January 7, 1953. Paratypes: Brazil: Same data as types, various dates in May, July, August, and September, two males and five females; Rio Laeiss, Blumenau, Santa Catarina, October (F. H. Hoffman), two males; Jaragua do Sul, Santa Catarina, August (F. Hoffman), one male; Castro, Paraná, one female; Prov[ince] Rio [de Janeiro] (Zikan), one female; Rio [de Janeiro?] (Derg.), one female; Alto de Serra, São Paulo, November, December (R. Spitz), two males; Minas Gerais, November (J. F. Zikan), one female. The holotype and allotype are in the collection of the American Museum of Natural History; paratypes are in the collections of that institution, of the British Museum (Natural History), and of the United States National Museum.

RANGE: Brazil (the states of Minas Gerais,

São Paulo, Rio de Janeiro, Paraná, and Santa Catarina). This species is found in the Humid Subtropical Zone at elevations of up to about 1500 feet. The adults have been captured in January, May, and July through December.

REMARKS: Eighteen specimens and nine genitalic dissections were studied. The relationships of this species are somewhat uncertain. By color and maculation, particularly in the males, *perversa* is closely associated with both *eudoxa* and *trisorca*. The present species is smaller and tends to have less clearly defined maculation, which is particularly noticeable in the females, in which the pattern becomes obsolescent.

The genitalia do not closely approximate these structures in *eudoxa* and *trisorca*, with the exception of the aedeagus. The processes of the valves and the female structures are more like those found in *sadrina* and some of its close relatives.

***Melanolophia triloba*, new species**

Plate 4, figure 12; text figures 29, 117

Tephrosia bostar DRUCE, 1892 (1891-1900), p. 76 (*partim*).

This is another small species with moderately well-defined cross lines, at least in the outer portion of the wings above. The upper surface of the males is well covered with dark brown scales, producing relatively dark-colored wings, while the females are less heavily dusted and hence appear lighter in color, with the cross lines being more prominent as a result. The species is found in Mexico and Guatemala.

MALE: Head, vertex brownish gray; front buff, dark brown across top and faintly darker on each side by eye; palpi with first segment pale buff below at base, distally and remaining segments with mixed brownish gray and brown scales. Thorax grayish brown above, with brownish gray collar, patagia buff, with brown transverse band near end; below pale buff; legs pale buff, variably spotted with dark brown scales. Abdomen with mixed grayish brown and brown scales above; below paler.

UPPER SURFACE OF WINGS: Forewings with ground color pale gray or pale buff, more or less heavily and evenly overlain with brown scales and scattered dark brown

scales; cross lines weakly defined, medium to dark brown; t. a. and median lines tending to be obsolescent; discal spot blackish brown, small; t. p. line weakly dentate and thickened on veins, slightly concave opposite cell and in cell Cu_2 , weakly shaded distally with dark brown above inner margin; s. t. line equidistant between apex and origin of t. p. line, of brownish black spots, those in cells M_1 and M_2 tending to be shaded distally with dark brown, represented in upper part of wing only; terminal area darker brown than subterminal area; fringe dark grayish brown, paler opposite vein endings. Hind wings concolorous with forewings; median line shaded distally at anal margin by broad, dark brown patch in many specimens; discal spot blackish brown, small; extradiscal line obsolescent in anterior portion of wing, shaded distally by narrow stripe of ground color and a wider, more nebulous brown band; terminal area darker than subterminal area; fringe like that on primaries.

UNDER SURFACE OF WINGS: Forewings pale grayish brown, evenly sprinkled with brown scales except along inner margin; hind wings slightly paler; discal spots blackish brown, small; otherwise without definite maculation except for weak indication of s. t. line in upper part of primaries and, in some specimens, faint indications of other cross lines.

LENGTH OF FOREWING: 14 to 17 mm.; holotype, 16 mm.

FEMALE: Similar to male, but with upper surface of wings slightly paler in color and with cross lines appearing slightly better defined. Under surface tending to have maculation a bit more strongly represented than in male.

LENGTH OF FOREWING: 15 to 18 mm.; allotype, 18 mm.

MALE GENITALIA: Uncus very slender, sharply narrowed from broad base, terminating in single point; socius represented by about five or six setae; gnathos swollen medially, heavily sclerotized, asymmetrical, having two large lateral swellings and a longer, bluntly pointed, rugose projection arising between them, extending to left side; each valve with moderate costal swelling; valvula with small, raised area at foot of long row of elongate setae; processes of valves asymmet-

rical, one on right side longer and heavier than one on left; right process arising from wide base, slightly sinuous in course, slightly wider medially, distal one-half with band of closely set setae occupying about one-half of width of process, arising on outer side and extending to inner side before apex, the apex curved outwardly and thickly covered with fine setae, extending as far as middle of uncus; left process extending to posterior margin of tegumen, with slender arm of even width, with elongate, spine-like apex slightly curving inwardly; anellus with broad, truncate base, tapering posteriorly, with apical portion broadly swollen, wider than base; tegumen broadest posteriorly, narrowed anteriorly; aedeagus slightly shorter than combined lengths of uncus, tegumen, and saccus, with narrow, digitate, sclerotized projection posteriorly, and with several longitudinal, slightly counterclockwise striations on dorsal surface; vesica unarmed. Abdomen with both sets of tufts on A_8 present, outer ones shorter than inner and arising from basal sack-like protuberance; posterior double comb consisting of about a dozen modified, well-spaced setae medially on each side, laterally with six or eight more closely spaced setae.

FEMALE GENITALIA: Sterigma with prominent genital plate, narrow anterior to sinus vaginalis, anterolateral margins tapering, extending well posteriad of sinus vaginalis and becoming more membranous and convoluted; lamella antevaginalis absent, replaced by shortly projecting lip of ductus bursae; lamella postvaginalis heavily sclerotized, asymmetrical, arising more on left side than on right, subtriangular in outline, apex bluntly pointed and with tuft of scales; ductus bursae heavily sclerotized, conical, ventral lip extending beyond genital plate, asymmetrical, left side longer than right, median lobe more strongly developed on left side, the sides with several small, transverse ridges, ductus bursae becoming membranous for short distance before joining corpus bursae ventrally; corpus bursae moderately long, weakly sclerotized and rugose around junction with ductus bursae; signum very small.

TYPES: Holotype, male, and allotype, female, Jalapa, [Veracruz], Mexico (W. Schaus). Paratypes, all from Mexico: *Vera-*

cruz: Jalapa, various dates and collectors, eight males, 17 females; Orizaba, various dates and collectors, 10 males, 17 females; Teocelo, September, one female; Misantla, one male; Cordoba, various dates and collectors, six males, six females; Coatepec, one female, identified as "*Tephrosia bostar* Druce, B. C. A. Lep. Het., Godman-Salvin coll." *Chiapas*: Santa Anita, July (C. C. Hoffmann), one male. *Jalisco*: Guadalajara, one female. *Oaxaca*: No further data, one female. *Morelos*: Cuernavaca, June, 1906, one female. The holotype and allotype are in the collection of the American Museum of Natural History; paratypes are in the collections of that institution, of the United States National Museum, and of the British Museum (Natural History).

In addition to the above, the following specimens have been examined: One male, one female, "Everglades, Florida"; these are undoubtedly specimens received from a dealer with incorrect data. Guatemala: Cerro Zunil, 4000 to 5000 feet (Champion), one male, identified as "*Tephrosia bostar* Druce, B. C. A. Lep. Het., Godman-Salvin coll."; Purulha, July (Schaus and Barnes), one female. Costa Rica: Cachi, October, one female. No data, two females.

RANGE: Mexico (the states of Veracruz, Chiapas, Jalisco, Oaxaca, and Morelos), Guatemala, and Costa Rica. This species occurs in the Tropical Wet and Dry Zone, in the mountains of central Mexico, Guatemala, and Costa Rica at elevations of from 1000 to 5500 feet. It is on the wing in January, February, March, April, June, July, September, October, and November.

REMARKS: Eighty specimens and 11 genitalic dissections were examined. This species is quite similar in its markings to *substriata*, but the present species is much darker in coloration and has a more distinct and contrasting pattern above.

The male genitalia are distinguished by the long, slender uncus, by the very large, asymmetrical, trilobed gnathos, and by the fact that the process of the right valve is longer than the slender, spine-like process of the left valve. The female genitalia are easily recognized by the presence of the large, convoluted area of the sterigma posterior to the sinus

vaginalis, by the well-sclerotized, projecting lamella postvaginalis, and by the prominent ductus bursae.

***Melanolophia penicilla*, new species**

Plate 4, figure 13; text figures 30, 118

This is a small species with poorly defined maculation. The upper surface of the wings is pale brown, and the most obvious maculation is the dark area in the outer portion of the primaries opposite the cell. It occurs in Ecuador, Peru, and Bolivia.

MALE: Head, vertex and front pale buff or pale grayish brown, with scattered brown scales, particularly between antennal bases and across top of front; palpi pale buff, with variable number of scattered brown and dark brown scales. Thorax above pale buff or pale grayish brown; posterior region of collar, and patagia and thorax, each with narrow, brown, transverse band; below pale buff; legs pale buff, variably spotted with brown and dark brown scales. Abdomen pale grayish brown above, with scattered brown scales; paler below.

UPPER SURFACE OF WINGS: Forewings with ground color pale buff, heavily and evenly overlain with pale grayish brown and brown scales; cross lines very weakly defined, brown; t. a. line and median cross lines obsolescent; discal spot brownish black, very small; t. p. line slightly thickened on veins in some specimens and faintly shaded distally with slightly darker scales; s. t. line represented by prominent, brownish black spots opposite cell and by smaller dots above inner margin, the former often shaded by narrow, pale, dentate line and continued toward wing margin as brownish black area; apex of wing of ground color in some specimens; terminal line represented by black intravenular dots; fringe concolorous with, or slightly paler than, wing. Hind wings concolorous with forewings; median line broad, rather diffuse, passing basad of very small discal spot; extradiscal line complete, gently curved or weakly angled, tending to be slightly thickened on veins, in some specimens shaded basally by band of ground color, distally by very narrow band of ground color and wider band of brown scales; outer portion of wing slightly darker than basal part; s. t. line incompletely repre-

sented by dark dots; terminal line and fringe like those of primaries.

UNDER SURFACE OF WINGS: Forewings pale grayish brown, evenly sprinkled with brown scales except along inner margin; hind wings slightly paler; discal spots brownish black, small; dark, prominent, subterminal band present on all wings, otherwise without maculation.

LENGTH OF FOREWING: 15 to 19 mm.; holotype, 17 mm.

FEMALE: Similar to male, but with upper surface of wings slightly more heavily dusted with brown scales, and with apex of forewing tending to be of ground color. Under surface also tending to be slightly more heavily dusted with brown, and to have subterminal band slightly wider.

LENGTH OF FOREWING: 17 to 18 mm.; allotype, 17 mm.

MALE GENITALIA: Uncus sharply narrowed from moderate base, distal portion with parallel sides, apex with single point; socius absent; gnathos moderately wide, slightly enlarged medially into small, rounded, rugose, flattened, plate-like structure; each valve with very prominent costal tubercle and tuft of elongate setae; valvula without spine patch, but with small, weakly sclerotized area having three or four very long setae; processes of valves asymmetrical, one on left side longer than that on right; right process with basal one-third slightly widened posteriorly, central one-third narrowed and slightly curving outwardly, terminal one-third broadest, most heavily sclerotized, with rounded apex, entire length of outer surface heavily set with numerous short to moderately long, inwardly projecting spines extending across dorsal surface, the process extending as far as base of uncus; left process extending to beyond middle of uncus, shaped like right process but with terminal, widened portion longer, and having elongate series of dorsal spines as on right side; anellus with deep, broadly rounded base, narrowed medially and slightly widened posteriorly into Y-shaped apical portion; tegumen widest medially, with saccus broadly U-shaped; aedeagus slightly shorter than combined lengths of uncus, tegumen, and saccus, with elongate, slender, sclerotized projection posteriorly, and with anterior

two-fifths narrowing to an elongate point; vesica unarmed or with a weakly sclerotized, narrow strip. Abdomen with both sets of tufts on A_3 present, outer ones shorter and heavier than inner and arising from basal sack-like protuberance; posterior double comb consisting of from 11 to 14 modified setae on each side, laterally becoming more closely spaced.

FEMALE GENITALIA: Sterigma with prominent genital plate, raised, ring-like, encircling sinus vaginalis, becoming more membranous distally; lamella antevaginalis very large, prominent, arising from sides, convoluted, ventrally in form of large, rugose, lobate process extending beyond posterior margin of sternum; lamella postvaginalis projecting as two sclerotized lobes from posterior portion of ductus bursae, separated by slightly more than their width by U-shaped division; ductus bursae short, sclerotized, lateral margins appearing thicker than median region, enlarged posteriorly, slightly constricted medially, joining corpus bursae ventrally; corpus bursae moderately long, slightly enlarged anteriorly; signum small.

TYPES: Holotype, male, Zamora, [Loja], Ecuador, May, 1886; allotype, female, same data, July, 1886. Paratypes: *Ecuador*: same data as types, March, May, 1886, five males; "Environs de Loja," [Loja], 1889, 1892, three males. *Peru*: Satipo, [Junin], February, 1941, March, June, 1948 (P. Paprzycki), two males, one female; Chanchamayo, [Pasco], 2000–7500 feet, one male, (Schuncke), one male; Pozuzu, Huánuco, 800–1000 meters (W. Hoffmanns), one male; Cerro de Pasco, Huancabamba, January, 1905, 3100 feet (E. Boettger), one male. *Bolivia*: Latitude $17^{\circ} 46' 55''$ S., longitude $63^{\circ} 5' 34''$ W., one male; Chimate, September, 1900, 760 meters (Simons), one male; Province del Sara, department of Santa Cruz, December, 450 meters (J. Steinbach), one male. The holotype and allotype are in the collection of the United States National Museum; paratypes are in the collection of the above institution, of the American Museum of Natural History, and of the British Museum (Natural History).

RANGE: Ecuador (the province of Loja), Peru (the department of Junin and Pasco), and Bolivia (the department of Santa Cruz).

This species is found along the eastern foothills of the Andes Mountains, at elevations of from about 1000 to 3500 feet. It has been taken in March, May, June, July, September, and December.

REMARKS: Twenty specimens and seven genitalic dissections were studied. The coloration of the upper surface of the wings is somewhat variable in this species, as it is dependent upon the amount of brown scalation over the paler ground color. In some specimens this takes the form of strigations, and a finely mottled appearance is the result. The cross lines are usually obscured by this mottling. The broad, prominent, subterminal band on the under side of all wings is a characteristic feature of this species.

The diagnostic features of the male genitalia include the slender, attenuate uncus, the thin, rounded median area of the gnathos, and the configuration of the processes of the valves. The left one is longer than the right; both are enlarged terminally for some distance and have numerous, dorsally curving spines. The female genitalia can be recognized by the bifurcate lamella postvaginalis, the prominent, lobate lamella antevaginalis, and by the sclerotized ductus bursae.

Melanolophia atrifascia, new species

Plate 4, figure 14; text figure 31

This is a small, ochraceous species, with rather clearly defined cross lines and a dark brown area on the outer part of the forewings above opposite the cell. On the under side of the wings the broad, dark, terminal band is characteristic. The species is known only from the Canal Zone.

MALE: Head, vertex and front pale buff or creamy white, with dark brown scales between antennal bases, broadly across top of front and laterally on each side by eye; palpi pale buff, laterally with variable amount of brown scaling. Thorax pale buff or creamy white above, with a few scattered brown scales; collar buff or grayish brown; patagia with slender, dark brown transverse bar in most specimens; below creamy white; legs pale buff or creamy white, forelegs with brownish black scaling, mesothoracic and metathoracic legs very sparsely dotted with grayish brown scales. Abdomen pale buff

above, with brown scaling above on middle of segments; paler below.

UPPER SURFACE OF WINGS: Forewings with ground color pale buff, with scattered ochraceous and dark brown scales; cross lines weakly or moderately well represented; t. a. and median lines represented by costal spots, in most specimens obsolescent across wing, in some indicated by thickening on veins; discal spot dark brown, small; t. p. line arising from costal spot, outwardly dentate on veins, weakly shaded distally by ochraceous or light brown scales; s. t. line equally spaced between apex and origin of t. p. line, represented by dark brown cellular spots, tending to be reduced in lower part of wing, broadly shaded distally by dark brown or brownish black in cells R_5 , M_1 , and M_2 , in some specimens lightly shaded with brown at tornus; terminal line of prominent, black, intravascular spots; fringe concolorous with wing. Hind wings concolorous with forewings; median line broadly shaded distally with brown, in some specimens extending almost as far as small, brownish black discal spot; extradiscal line complete, tending to be weakly outwardly dentate on veins, shaded distally with narrow band of ground color and broader band of brown scales; s. t. line, terminal line, and fringe like those on primaries.

UNDER SURFACE OF WINGS: Forewings pale buff, overlain with brown and grayish brown strigations except along paler inner margin; hind wings slightly paler, with fewer dark strigations; discal spots brownish black, small on forewings, slightly larger on secondaries; maculation absent in most specimens except for costal dots of cross lines, and very broad, prominent, blackish gray band in subterminal and terminal areas of all wings.

LENGTH OF FOREWING: 15 to 17 mm.; holotype, 17 mm.

FEMALE: Unknown.

MALE GENITALIA: Uncus sharply tapering, elongate, apex rounded, terminating in single point; socius absent; gnathos constricted ventrolaterally, swollen medially into moderate process, with slight median indentation, its surface rugose; each valve with prominent costal tubercle and tuft of elongate setae; valvula without spine patch; processes of valves asymmetrical, one on left side slightly

longer than one on right; right process slender, sinuous, basal section situated under curled edge of valve, shorter terminal section more heavily sclerotized, tapering, apically recurved, extending beyond posterior region of anellus; left process extending to base of uncus, basal section similar to right side, terminal section elongate, broader, terminal part with many heavy spines; anellus slightly narrowed medially, slightly widened posteriorly with small apical swelling; tegumen short, with prominent posterolateral angles, saccus elongate, flatly U-shaped; aedeagus slightly shorter than combined lengths of uncus, tegumen, and saccus, with very heavily sclerotized margin on left side and apically, narrowed anteriorly; vesica unarmed. Abdomen with both sets of tufts on A_3 present, outer ones shorter and heavier than inner and arising from basal, sack-like protuberance; posterior double comb consisting of about 10 modified, well-spaced setae medially on each side, laterally with numerous setae very closely spaced.

FEMALE GENITALIA: Unknown.

TYPES: Holotype, male, Barro Colorado [Island], Canal Zone, March 12, 1936 (Gertsch, Lutz, Wood). Paratypes, three males, same data as type, February 9, 10, 1936, March 19, 1936. The holotype and paratypes are in the collection of the American Museum of Natural History.

RANGE: Canal Zone (Barro Colorado Island). The specimens were captured in February and March.

REMARKS: Four specimens and two genitalic dissections were examined. The very broad and prominent black band on the outer portion of the under side of all wings is a characteristic feature of this species. A similar, though narrower, band is found in *penicilla*. In addition, *atrifascia* has more clearly defined maculation and is slightly lighter in color than *penicilla*.

The male genitalia also show certain similarities to those of *penicilla*, in such characters as the elongate uncus, the rounded gnathos, and the longer left process of the valves. In *atrifascia*, the aedeagus is much more heavily sclerotized terminally, and the process of the right valve is tapering and spine-like.

Melanolophia homofascia, new species

Plate 4, figure 15; text figure 32

This species is very similar to *atrifascia*. It tends to be slightly paler and to have a broader median band on the upper surface of the secondaries. The male genitalia offer good characters for distinguishing the present species. It occurs in Venezuela.

MALE: Head, thorax, and abdomen similar to those of *atrifascia*.

UPPER SURFACE OF WINGS: Forewings with ground color pale buff, with scattered ochraceous and dark brown scales; cross lines like those of *atrifascia*, but with median line tending to be slightly more prominent and dentate; s. t. line with spots in cells M_1 and M_2 larger and darker than others, with distal shading in cells R_5 , M_1 , and M_2 ; terminal line and fringe like those in *atrifascia*. Hind wings concolorous with forewings; similar to those of *atrifascia*, but with median line tending to be broader and with s. t. line more complete and better defined.

UNDER SURFACE OF WINGS: Similar to that of *atrifascia*, but with subterminal band tending to be narrower.

LENGTH OF FOREWING: 15 to 17 mm.; holotype, 17 mm.

FEMALE: Unknown.

MALE GENITALIA: Similar to those of *atrifascia*, differing mainly as follows: gnathos slightly more pointed and slender; process of right valve slender, basal section situated under curled edge of valve, median section narrowed, terminally curved outwardly, apex tapered posteromedially, with numerous short dorsal setae, the one at tip of apex longest and heaviest, recurved, extending to posterior margin of tegumen; aedeagus with narrow, very heavily sclerotized margin on left side and at pointed apex.

FEMALE GENITALIA: Unknown.

TYPES: Holotype, male, San Esteban, Venezuela, July, 1909 (S. M. Klages). Paratypes, all from Venezuela: Same data as holotype, June, August, 1909, three males; Las Quiguas, Esteban Valley, one male. The holotype is in the collection of the British Museum (Natural History); paratypes are in the collection of that institution and of the United States National Museum.

RANGE: Venezuela, presumably in the northwestern or western part of the country. The adults have been taken in June, July, and August.

REMARKS: Five specimens and three genitalic dissections were studied. This species is closely allied to *atrifascia*, and the male genitalia offer the best way to separate the two species. In the present taxon, the process of the right valve is of even width throughout and has numerous terminal setae, while in *atrifascia* the process is shorter and has a single large spine at the end.

Melanolophia sadrina (Schaus), new combination

Tephrosia sadrina SCHAU, "1900" [1901a], p. 184.

This is a small to moderate-sized species, having a pale upper surface with fairly distinct cross lines. There is usually a blackish marginal patch opposite the cell on the forewings, and the under side often has a dark terminal band. The species occurs in Mexico, Central America, and Colombia in two sub-specific populations.

Melanolophia sadrina sadrina (Schaus)

Plate 4, figure 16; text figures 33, 119

Tephrosia bostar DRUCE, 1892 (1891-1900), p. 76 (*partim*).

Tephrosia sadrina SCHAU, "1900" [1901a], p. 184.

This subspecies is relatively small and has the upper surface of the wings pale buff or pale ochraceous brown, with fairly distinct maculation. It occurs in Mexico and Central America.

MALE: Head, vertex and front pale buff, with dark brown scales between antennal bases, in form of band across top of front, and laterally on each side by eye; palpi pale buff, laterally with brown and dark brown scales. Thorax and collar pale buff, with a few scattered brown scales; patagia with slender, brownish black, transverse band; below creamy white; legs pale buff or creamy white, variably spotted with brown and dark brown scales, particularly on forelegs. Abdomen above pale buff, with a few ochraceous brown scales; below slightly paler.

UPPER SURFACE OF WINGS: Forewings with ground color pale buff, with scattered ochraceous, brown, and dark brown scales; cross

lines weakly or moderately well represented, brown; t. a. and median lines originating as dark brown costal dots, latter usually larger than t. a. dot, both lines weak or obsolescent, in some specimens slightly thickened on veins; discal dot dark brown, small, in some examples included in median line; t. p. line outwardly dentate and thickened on veins, shaded distally with brown or brownish black above inner margin, in some specimens weakly shaded with brown opposite cell; s. t. line equally spaced between apex and origin of t. p. line, represented by dark cellular spots opposite cell and above tornus, usually obsolescent in remainder of wing, prominently shaded distally with dark brown or brownish black in cells R_5 , M_1 , and M_2 , and weakly shaded in some specimens at tornus; terminal line of black intravenular spots; fringe concolorous with wing. Hind wings concolorous with forewings, in some specimens basal and median areas slightly paler; median line shaded distally by narrow stripe of ground color and by broad, brown band, the latter tending to become rather nebulous distally and extending to small, brownish black discal dot; extradiscal line complete, prominent in most specimens, extending more or less straight across wing, outwardly dentate and thickened on veins, shaded distally like median line but not so broadly; s. t. line, terminal line, and fringe like those on primaries.

UNDER SURFACE OF WINGS: Forewings pale grayish white or pale buff, overlain with pale grayish brown or pale brown scales, except along paler inner margin; hind wings slightly paler; discal dots brownish black, small; most specimens without maculation except for broad grayish black or grayish brown subterminal band on forewings and narrow band, incomplete in many specimens, on hind wings.

LENGTH OF FOREWING: 16 to 19 mm.

FEMALE: Similar to male, with upper surface of wings tending to be slightly brighter in color and with maculation slightly darker and better defined. Under surface tending to be slightly brighter and with more maculation than that of male.

LENGTH OF FOREWING: 17 to 20 mm.

MALE GENITALIA: Uncus sharply tapering, apex rounded, terminating in single point;

socius absent; gnathos constricted ventrolaterally, extended posteroventrally into tapering, rugose process, rounded or with slight median indentation apically; each valve with prominent costal tubercle and tuft of elongate setae; valvula without spine patch; processes of valves of equal size and shape, rarely with one slightly longer than the other, not attaining anterior margin of gnathos, arising from subtriangular basal section, extending posteriorly as slender sclerotized arms, angled basally, with tapering, more heavily sclerotized, slightly outcurving apices; anellus slightly tapering posteriorly; tegumen with prominent posterolateral angles, saccus evenly rounded; aedeagus slightly longer than combined lengths of uncus, tegumen, and saccus, slender, with very heavily sclerotized margin on left side and apically; vesica unarmed. Abdomen with both sets of tufts on A_3 present, outer ones shorter and heavier than inner and arising from basal sack-like protuberance; posterior double comb consisting of nine to 11 modified, well-spaced setae medially on each side, laterally with numerous setae very closely spaced.

FEMALE GENITALIA: Sterigma small, membranous; lamella antevaginalis fused with posterior portion of ductus bursae, heavily sclerotized, divided medially, each side lobate and curved outwardly; lamella postvaginalis large, wider than ductus bursae, heavily sclerotized, produced posteriorly as two pointed, well-separated, elongate projections; ductus bursae heavily sclerotized and rugose, dorsoventrally flattened, slightly longer than wide, joining corpus bursae ventrally; corpus bursae elongate, lightly sclerotized and rugose ventrally anterior to junction with ductus bursae for almost one-half of length of corpus bursae; signum very small.

TYPE: U.S.N.M. No. 12504, a female.

TYPE LOCALITY: Orizaba, Veracruz, Mexico.

RANGE: Mexico (the states of Veracruz and Michoacan), British Honduras, Guatemala, Honduras, and Costa Rica. This species apparently inhabits both the Tropical Wet Zone of eastern Mexico and eastern Central America and the Tropical Wet and Dry Zone of western Central America. It has been taken from about sea level to 5500 feet in elevation during every month except October and

November. (See Appendix for locality data of specimens examined.)

REMARKS: Sixty-three specimens and 19 genitalic dissections were studied. There is some variation in the color of the wings and in the strength of the maculation. The females tend to be brighter and more contrastingly marked than the males.

The male genitalia are similar to those of *atrifascia*, and are distinguished by the fact that the elongate, well-sclerotized processes of the valves are symmetrical and of equal length. The female genitalia can be recognized by the fact that the heavily sclerotized lamella postvaginalis terminates in two strong, well-separated points.

***Melanolophia sadrina conara*, new subspecies**

Plate 4, figure 17

This subspecies is larger and slightly darker in color, and has less contrasting maculation, than the nominate population. It occurs in Colombia.

MALE: Head, thorax, and abdomen similar to those of nominate subspecies, but tending to be slightly more heavily dusted with grayish brown and brown scales.

UPPER SURFACE OF WINGS: Forewings like those of nominate subspecies, but more heavily dusted with brown and dark brown scales, producing a more mottled, rougher appearance; cross lines tending to be obscured by darker scales; t. p. line strongly dentate outwardly on veins, with very little distal shading except above inner margin; s. t. line weakly represented, with very little dark scaling opposite cell. Hind wings concolorous with forewings, heavily dusted with dark scales, otherwise similar to those of nominate subspecies.

UNDER SURFACE OF WINGS: Similar to those of nominate subspecies but more heavily dusted with dark scales.

LENGTH OF FOREWING: 18 to 21 mm.; holotype, 19 mm.

FEMALE: Unknown.

MALE GENITALIA: Similar to those of nominate subspecies.

FEMALE GENITALIA: Unknown.

TYPES: Holotype, male, Muzo, [Santander], Colombia, May, 1915. Paratypes: Colombia: Muzo, [Santander], January, May, August, six males, elevation 400–800 meters

(Fassl), one male; Muzo, Rio Cantinero, elevation 400 meters (A. H. Fassl), two males; Popayan, [Caqueta], 1895, 1897, two males; La Palma, Cundinamarca, August (Mathan), one male; Canache, Cundinamarca, August (M. de Mathan), one male; Minca, [Magdalena], elevation 2000 feet (H. H. Smith), one male; Palmira, Valle del Cauca, one male. The holotype is in the collection of the United States National Museum; paratypes are in the collections of that institution and of the British Museum (Natural History).

RANGE: Colombia (the departments of Magdalena, Valle del Cauca, Santander, Cundinamarca, and Caqueta). This species is found in the Highlands Zone, at elevations of from about 1300 to 4800 feet. It has been captured in March, May, and August.

REMARKS: Sixteen specimens and eight genitalic dissections were studied. Unfortunately females of this subspecies are not available for description and comparison.

***Melanolophia sadrinaria*, new species**

Plate 4, figure 18; text figures 34, 120

This moderate-sized species is very similar to *sadrina* and can be best separated from it on genitalic characters. It occurs in Mexico and Costa Rica.

MALE: Head, front light buff, with numerous grayish brown scales; vertex pale buff, with dark brown scales across top and across lower portion; palpi pale buff, largely dark brown laterally. Thorax pale buff above, with a few scattered brown scales; collar grayish brown, with scattered brown scales; patagia with slender, dark brown, transverse band; below creamy white; legs pale buff or creamy white, variably spotted with brown and dark brown scales, particularly on forelegs. Abdomen above pale buff, with scattered pale brown scales; below slightly paler.

UPPER SURFACE OF WINGS: Forewings with ground color pale buff, overlain with numerous ochraceous, brown, and dark brown scales; cross lines weakly or moderately well represented, brown; t. a. and median lines originating as costal dots, both lines rather weak, median line including very small discal dot, width of distal shade increasing toward inner margin; t. p. line outwardly dentate and thickened on veins, tending to become obsolescent in middle of wing, shaded distally

with brown or dark brown in upper portion of wing and above inner margin, the latter with thin stripe of ground color between line and shading; s. t. line equidistant between apex and origin of t. p. line, of dark cellular spots, strongest in upper part of wing and above tornus, shaded distally with brownish black in cells M_1 and M_2 ; terminal line of black intravenular spots; fringe brownish gray, becoming paler toward inner angle and opposite veins. Hind wings concolorous with forewings, with basal and median areas slightly paler; median line broadly shaded distally by broad bar of dull blackish brown, extending almost to small discal dots; extradiscal line obsolescent in upper part of wing, shaded distally by narrow stripe of ground color and by broader band of brown; s. t. line, terminal line, and fringe like those on primaries.

UNDER SURFACE OF WINGS: Forewings pale buff, overlain with grayish brown scales, except along ochraceous costal margin and paler inner margin; hind wings slightly paler, less heavily overlain with dark scales; discal dots grayish brown or brown, very small; traces of median and t. p. lines present, plus broader brownish gray subterminal band, widest anteriorly, becoming narrow and incomplete on secondaries.

LENGTH OF FOREWING: 20 mm. (holotype).

FEMALE: Similar to male, with upper surface of wings tending to be slightly lighter in color and to have more prominent discal dots. Under surface tending to be slightly lighter in color and with more maculation than that of male.

LENGTH OF FOREWING: 19 mm. (allotype).

MALE GENITALIA: Uncus sharply tapering, apex slightly swollen, hood-like; socius absent; gnathos enlarged medially into pair of large, widely separated, rugose, recurved processes; each valve with prominent costal tubercle and tuft of elongate setae; valvula without spine patch; processes of valves asymmetrical, one on left side slightly more than one and one-half times as long as one on right; right process with inner margin straight, outer margin slightly S-shaped, becoming more heavily sclerotized posteriorly in concave portion of S, terminally slightly swollen distally, with narrow band of spines pointing toward base of uncus apically, process extending to posterior end of anellus; left

process extending beyond base of uncus, basal portion weakly curved, remainder fairly straight, with narrow row of setae on distal side and terminally; anellus slightly constricted medially, expanded posteriorly into rounded projection; tegumen with parallel sides posteriorly, with saccus somewhat narrowed and rounded anteriorly; aedeagus equal in length to combined lengths of uncus, tegumen, and saccus, with slender, tapering, sclerotized projection posteriorly, and with several longitudinal striations on dorsal surface; vesica unarmed. Abdomen with both sets of tufts on A_3 present, outer ones shorter and heavier than inner and arising from basal, sack-like protuberance; posterior double comb consisting of 12 or 13 modified, well-spaced setae medially on each side, laterally with numerous setae very closely spaced.

FEMALE GENITALIA: Sterigma small, membranous; lamella antevaginalis absent; lamella postvaginalis represented by small pair of lightly sclerotized lobes dorsally between sides of ductus bursae; ductus bursae very heavily sclerotized, very large, rugose, enlarged posteriorly, dorsal surface projecting ventrad posteromedially and becoming slightly more membranous, ductus tapering anteriorly to ventral junction with corpus bursae, very slightly enlarged thereupon; corpus bursae elongate, lightly sclerotized and rugose ventrally anterior to junction with ductus bursae, for about one-half of length of corpus bursae; signum very small.

TYPES: Holotype, male, San José, Costa Rica, elevation 5000 feet; allotype, female, Matamoros, Puebla, Mexico, November 2, 1920 (C. C. Hoffmann). The holotype is in the collection of the United States National Museum; the allotype is in the collection of the American Museum of Natural History.

RANGE: Mexico (the state of Puebla) and Costa Rica. This is a species of the higher elevations, as far as can be known from the limited material available, as the two specimens were taken at 4200 and at 5000 feet. The only date of capture is November.

REMARKS: Two specimens and two genitalic dissections were studied. This species is closely similar to *sadrina* but can be separated from that moth by its slightly larger size, by the slightly darker wings, and by the less extensive area of dark scaling opposite

the cell beyond the s. t. line. It apparently flies at higher elevations than does *sadrina*.

The genitalia should be studied to make certain of the identification. No difficulties will be encountered, as the organs of both sexes are quite distinct. In the present species the broadly separated, recurved lobes of the gnathos and the more elongate process of the left valve are distinctive in the male, and the configuration of the ductus bursae, being rounded posteriorly and somewhat funnel-like, in the female is diagnostic.

It is interesting to note that the maculation and the female genitalia of this species show a rather close relationship to those of the preceding species, while the male genitalia are more similar to those of certain species in the next group.

GROUP V

The upper surface of the wings of the species in this group are brown, grayish brown, or buff in color, occasionally variably overlain with darker brown scales, and most species have poorly defined cross lines of the basic pattern. The species of this group are of about the same size as those found in the two preceding groups. In the length of the forewing they vary from about 13 to 23 mm., with the species averaging from about 15 to 21 mm.

The male genitalia have either a simple, tapering uncus or one that is slightly swollen. The gnathos is large and broadly swollen and has either a protuberance with two small lobes or is bifurcate. The anellus is weakly or strongly constricted medially. Two species have the process of the left valve longer than that of the right side, several are equal or very nearly equal in length, with the right process slightly longer, and in only one species is the right process markedly longer than the left. The lateral hair pencils of the third abdominal segment are not reduced or missing, nor are the terminal portions fused together.

The female genitalia furnish good characters for the recognition of this group. All the species, except one, have a symmetrical, round or elliptical, well-sclerotized sterigma, and it is usually large. The lamella antevaginalis may be of a prominent, lip-like type or absent, but in most species it is a moderate to

large, lobate, or apically bifurcate process. The lamella postvaginalis is an elongate, slender process, usually with the apex cleft, and it is as long as the lamella antevaginalis in most species. The ductus bursae is usually short and membranous or only lightly sclerotized, then narrowed and joining a short, rugose arm of the corpus bursae ventrally.

The early stages and food plants of three species are known; all of these occur in the United States and Canada. This information is noted under the appropriate species.

Group V contains nine species and includes all five of the species that occur in North America, north of Mexico; one of these is also found in Mexico. Two species are found in Mexico and Central America. One is known in Costa Rica and Panama; and one, only from Panama.

***Melanolophia imitata* (Walker)**

Boarmia imitata WALKER, 1860, p. 395.

This is a fairly large, brownish gray to grayish brown species, usually with a clearly defined, dentate t. p. line on the primaries. The other cross lines are more weakly represented, although the s. t. line may be prominent in some specimens. This species is found on the west coast of North America from southern Alaska to southern California, and it occurs in three subspecific populations.

***Melanolophia imitata imitata* (Walker)**

Plate 5, figure 1; text figures 1, 35, 121

Boarmia imitata WALKER, 1860, p. 395. HULST, 1895, p. 42.

Alcis imitata: DYAR, "1902" [1903], p. 321.

Melanolophia imitata: BARNES AND McDUNNOUGH, 1914, p. 211; 1917, p. 118. McDUNNOUGH, 1920b, p. 14, pl. 1, fig. 1 (male genitalia), pl. 7, fig. 8 (male); 1938, p. 163. BLACKMORE, 1927, p. 42. MCGUFFIN, 1944, p. 126. JONES, 1951, p. 130. BOWMAN, 1951, p. 150. HARDY, 1957, p. D64. SILVER, 1960, p. 58. EVANS, 1962, p. 594, figs. 1-15 (adults, early stages, genitalia). SILVER, COLLIS, ALEXANDER, AND ALLEN, 1962, p. 29.

Tephrosia canadaria: PACKARD (not Guenée), 1876, p. 425 (*partim*).

Ectropis canadaria: GUMPPENBERG (not Guenée), 1892, p. 336 (*partim*).

Melanolophia canadaria var. *subgenericata* DYAR, 1904, p. 910. TAYLOR, 1908, p. 100. BARNES AND McDUNNOUGH, 1917, p. 118 (synonym of *imitata*).

Melanolophia subimitata FORBES, 1948, p. 60 (*nomen nudum*).

The nominate subspecies has the upper surface of the wings brownish gray, and this color is the darkest of the three subspecies; in some specimens there is a faint indication of a purplish brown suffusion on the wings. This is the most widespread of the subspecies, as it ranges from southern Alaska to the southern Sierra Nevada Mountains and to south of the San Francisco Bay area of California.

MALE: Head, vertex and front pale gray or pale grayish brown, front in some specimens slightly paler and with brown scales across top and between antennal bases; palpi with mixed pale gray, pale brownish gray, and pale buff scales. Thorax pale gray or pale grayish brown above, with scattered light brown and pale buff scales, collar slightly darker; below pale buff; legs pale buff, variably spotted with lightly grayish brown, brown, and blackish brown scales. Abdomen grayish brown or brown above, becoming paler posteriorly, with scattered brown, blackish brown, and pale buff scales; below paler.

UPPER SURFACE OF WINGS: Forewings with ground color pale grayish brown, heavily and evenly overlain with brown and brownish black scales; cross lines rather weakly defined except for dentate t. p. line, medium to dark brown; t. a. line weak to obsolescent; median line about equidistant between t. a. line and small, blackish brown discal spot, straight, tending to be outwardly toothed on cubital and anal veins; t. p. line complete, slightly outwardly bowed below cell and inwardly curved above anal vein, dentate on veins, often shaded distally by narrow, pale shade line, in some specimens a rather broad and nebulous dark band beyond this; s. t. line arising nearer apex than to origin of t. p. line, usually complete, in some specimens obsolescent in middle or lower portion of wing, represented by blackish brown or dark brown cellular spots; terminal line a series of small, black, intravenular spots; fringe concolorous with wing. Hind wings concolorous with forewings; median shade line equidistant between base of wing and blackish brown discal spot in most specimens, obsolete in upper part of wing; extradiscal line also obsolete in upper part of wing, narrowly shaded distally by

pale line and, in some specimens, by a broader, dark band; s. t. line more or less complete, as on forewings; terminal line and fringe like those on forewings.

UNDER SURFACE OF WINGS: Unicolorous pale grayish brown or pale buff, heavily sprinkled with brown scales except for inner margin of forewings, and with hind wings more lightly dusted; discal spots dark brown or blackish brown, small; maculation usually obsolescent, with t. p. and s. t. lines of primaries indicated in some specimens.

LENGTH OF FOREWING: 18 to 23 mm.

FEMALE: Similar to male, but more heavily dusted with brown and dark brown scales on slightly lighter ground color, and with maculation more strongly represented. Under surface tending to be more heavily covered with dark scales, and with maculation slightly more strongly represented than in male.

LENGTH OF FOREWING: 17 to 21 mm.

MALE GENITALIA: Uncus tapering, apical portion attenuate, terminating in strong point; socius represented by from four to seven setae; gnathos swollen medially, as wide as base of uncus, with widely separated, rugose, lateral projections, curving apically, and small median ridge; each valve with small costal tubercle and tuft of setae; valvula without spine patch, but with several setae; processes of valves very similar in size and shape, one on right side slightly longer than that on left; right process with broad, hollowed-out basal section, slightly constricted, then enlarged into short, capitate apical section, with outer portion of dorsal surface thickly covered with numerous inwardly directed setae, the process extending beyond anellus; left process very similar to right one, slightly shorter owing to smaller basal section; anellus with truncate base, constricted medially, enlarged posteriorly and rounded; tegumen widest posteriorly, saccus U-shaped; aedeagus slightly shorter than combined lengths of uncus, tegumen, and saccus, with tapering, sclerotized projection posteriorly, an elongate, slightly capitate anterior end, and with several longitudinal, slightly counterclockwise striations on dorsal surface; vesica unarmed. Abdomen with both sets of tufts on A_8 weakly represented, outer ones shorter than inner and arising from basal sack-like protuberance; posterior double

comb consisting of about 10 to 14 modified, well-spaced setae medially on each side, laterally with numerous setae very closely spaced.

FEMALE GENITALIA: Sterigma with prominent, elliptical genital plate of even width around sinus vaginalis, anterior portion more heavily sclerotized and rugose than posterior section; lamella antevaginalis convoluted, rugose, lip-like, covering about one-half to two-thirds of sinus vaginalis; lamella postvaginalis a short, thick projection extending posteriorly or posteroventrally, enlarged apically and indented medially in some specimens; ductus bursae slender, becoming more heavily sclerotized anteriorly before joining corpus bursae ventrally; corpus bursae elongate, lightly sclerotized and rugose anterior to ductus bursae; signum very small.

EARLY STAGES: The penultimate and ultimate instars have been described by McGuffin (1944). The complete life history has been given by Evans (1962), who illustrated the eggs, the setal pattern of the larvae, and the pupa.

FOOD PLANTS: The larvae feed primarily on the following conifers: *Pseudotsuga menziesii* (Mirbel) Franco, *Tsuga* spp., *Thuja plicata* Don, *Abies* spp., *Picea* spp., *Pinus* spp., and *Larix occidentalis* Nuttall. The caterpillars also are found on many other hosts, including *Alnus*, *Betula*, *Populus*, *Quercus*, and *Shepherdia* (McGuffin, 1944; Jones, 1951; Evans, 1962). On the west coast of Vancouver Island the preferred host is *Tsuga heterophylla* (Rafinesque) Sargent; foliage of all ages is eaten, but one-year-old needles are preferred (Silver *et al.*, 1962).

The caterpillars of this species, the "green-striped forest looper," may sometimes cause heavy defoliation. This species, plus a smaller number of the larvae of *Lambdina fiscellaria lugubrosa* (Hulst), caused "light to heavy defoliation on coniferous understory trees and light defoliation on many mature overstory hemlock" in Stanley Park, Vancouver, British Columbia, in 1958 (Silver, 1960).

Normally, though the larvae may be present in large numbers, they cause relatively little visible damage, probably owing to the fact that the eggs are laid singly, and the caterpillars are not gregarious. They do not eat the buds and seldom strip the foliage

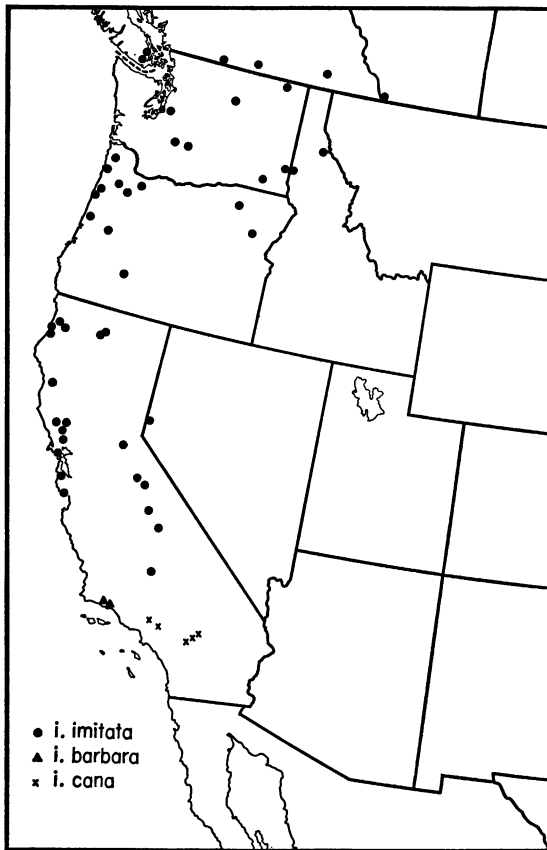


FIG. 1. Distribution of *Melanophia imitata* (Walker).

but move about and do not concentrate on any particular branch (Evans, 1962).

TYPES: The type of *imitata* is in the British Museum (Natural History). Dyar described *subgenericata* from a number of specimens from British Columbia, Washington, and Oregon. U.S.N.M. No. 7106 is hereby designated as the lectotype; the male genitalia are on a slide labeled "no. 4204, H.W.C."

TYPE LOCALITIES: "Vancouver's Island" (*imitata*); Kaslo Creek, British Columbia (*subgenericata*).

RANGE: Southern Alaska, British Columbia, southwestern Alberta (Bowman, 1951), northern Idaho, Washington, Oregon and California as far south as Kern County (see fig. 1). On the wing as early as January, but with most records being from March through August.

REMARKS: Two hundred and forty-five

specimens and 14 genitalic dissections were studied. This species is rather variable in the color of the wings and in the strength of the cross lines. In the males the upper surface of the wings is usually a brownish gray, although the color varies from a dark grayish brown to a more or less solid brown. The females tend to have a slightly lighter ground color than the males, on which the cross lines are more prominent. A melanic form exists at a very low level in the population, together with an even rarer intermediate form; examples of these are illustrated by Evans (1962, fig. 5).

The male genitalia are separable by the fact that the processes of the valves are capitate, with numerous setae on the dorsal surface, of similar shape but with the right process slightly longer than the one on the left valve. The sharply constricted anellus and the broad, weakly bifurcate gnathos are also characteristic. The female genitalia have a large genital plate, the lamella antevaginalis is lip-like and covers a good part of the ostial opening, and the lamella postvaginalis tends to be elongate, enlarged, and somewhat bifurcate apically.

The size, pattern, and color of this species place it in group V, but the female genitalia have characteristics of those of both this group and the preceding ones. The lamella antevaginalis is of the lip-like type found in the more primitive groups, while the lamella postvaginalis is of the more advanced, elongate type found in group IV.

***Melanophia imitata barbara* McDunnough**

Plate 5, figure 2; text figure 1

Melanophia imitata barbara McDUNNOUGH, 1940, p. 90.

This subspecies, from Santa Barbara County, California, has the upper surface of the wings with an even, brown, or pale olive brown color, and virtually no maculation.

MALE: Head, thorax, and abdomen like those of nominate subspecies, some specimens slightly more heavily dusted with brown scales.

UPPER SURFACE OF WINGS: Forewings with ground color pale grayish brown, very heavily and evenly overlain with grayish brown, brown, and dark brown scales, producing a uniform brown color, in some lights

giving the impression of an olivaceous brown; all cross lines obsolescent or completely absent; discal spot brown, small; fringe slightly paler than wing. Hind wings concolorous with forewings, with obsolescent maculation; discal dot and fringe like those on primaries.

UNDER SURFACE OF WINGS: Similar to upper surface, slightly paler in some specimens; without maculation except for dark discal dots.

LENGTH OF FOREWING: 20 to 21 mm.

FEMALE: Similar to male but with slight indications of t. p. and upper part of s. t. lines present on primaries of some specimens. Under surface like that in males.

LENGTH OF FOREWING: 19 to 20 mm.

MALE GENITALIA: Like those of nominate subspecies.

FEMALE GENITALIA: Like those of nominate subspecies.

EARLY STAGES: Unknown.

FOOD PLANT: Unknown.

TYPE: This subspecies was described from a single male (C.N.C. No. 4960).

TYPE LOCALITY: El Cielo Drive, Santa Barbara County, California.

RANGE: Known only from coastal Santa Barbara County, California (see fig. 1). On the wing in June and July.

REMARKS: Eight specimens and two genitalic dissections were studied. There appears to be very little individual variation in the short series of specimens studied. This subspecies can be distinguished from nominate *imitata* by its unicolorous brown or brownish olive wings, and by the absence of the usual cross lines.

***Melanolophia imitata cana*, new subspecies**

Plate 5, figure 3; text figure 1

This subspecies is gray or pale grayish brown, with fairly distinct maculation, and it is found in the mountains of southern California.

MALE: Head, thorax, and abdomen like those of nominate subspecies, with most specimens mainly pale grayish white.

UPPER SURFACE OF WINGS: Forewings with ground color pale grayish white, overlain with grayish brown and brown scales, producing a gray or pale grayish brown color; cross lines and maculation like those of nomi-

nate subspecies. Hind wings concolorous with forewings, as in nominate subspecies.

UNDER SURFACE OF WINGS: Unicolorous pale, shining grayish white, sprinkled with brown scales except for inner margin of forewings, and with hind wings more lightly dusted; otherwise like that of nominate subspecies.

LENGTH OF FOREWING: 19 to 22 mm.; holotype, 21 mm.

FEMALE: Similar to male, but with ground color less heavily overlain with grayish brown scales, and with maculation more strongly represented. Under surface slightly paler than that of male.

LENGTH OF FOREWING: 16 to 21 mm.; allotype, 20 mm.

MALE GENITALIA: Like those of nominate subspecies.

FEMALE GENITALIA: Like those of nominate subspecies.

EARLY STAGES: Unknown.

FOOD PLANT: Unknown.

TYPES: Holotype, male, upper Santa Ana River, San Bernardino County, California, May 19, 1949 (G. H. and J. L. Sperry); allotype, female, same data, June 12, 1949. Paratypes, all from California: Same data as types, May 18, 31, 1947, June 1, 1947, June 6, 12, 24, 26, 28, 1948, seven males, eight females; Barton Flats, San Bernardino County, June 3, 29, 1946 (G. H. and J. L. Sperry), two males, one female; east fork, Santa Ana River, San Bernardino County, June 9, 1947 (A. L. Melander), one male, one female; Walters Station, San Bernardino County, April, one male; near Lake Arrowhead, San Bernardino County, May 25, 1947, one male, three females; Buckhorn Flats, San Gabriel Mountains, Los Angeles County, elevation 6800 feet, June 3, 1950 (C. Hill), one male; Dark Canyon, Los Angeles County, elevation 3000 feet, April 10, 1947 (C. Henne), two females; above Chilao, Angeles Crest Highway, San Gabriel Mountains, Los Angeles County, May 5, 1947, elevation 7000 feet, one male. The holotype and allotype are in the collection of the American Museum of Natural History; paratypes are in the collections of that institution and of the California Insect Survey, University of California, Berkeley.

RANGE: The mountains of Los Angeles and San Bernardino counties, southern California

(see fig. 1). On the wing in April, May, and June.

REMARKS: Thirty-one specimens and six genitalic dissections were studied. This subspecies has the palest wing color of any of the populations of *imitata*, and this pale gray in both sexes is characteristic of *cana*. There is some variation in the strength of the maculation, as the pattern varies from being obsolescent to being clearly defined.

***Melanolophia centralis* McDunnough**

Plate 5, figure 4; text figures 2, 36, 122

Melanolophia centralis McDUNNOUGH, 1920a, p. 165; 1920b, p. 14, pl. 1, fig. 4 (male genitalia), pl. 7, fig. 7 (male paratype); 1938, p. 163.

This is another large species, similar to *imitata* but paler. In general appearance it is similar to *imitata cana*, particularly when old or worn specimens are at hand. The genitalia offer good specific characters for the recognition of the species. This taxon occurs in the southern Rocky Mountain states.

MALE: Head, thorax, and abdomen similar to those of *imitata cana*.

UPPER SURFACE OF WINGS: Forewings with ground color grayish white, variably overlain with brownish gray and brown scales; cross lines weakly to moderately well defined, t. p. line strongest, brown; t. a. line weak to obsolescent, represented by costal spot in some specimens; median line arising from costal spot, passing about 1 to 2 mm. basad of small, blackish brown, discal spot, concave below cubital vein; t. p. line complete, dentate, slightly outwardly bowed below cell and inwardly curved above outer angle, concave between veins, shaded distally opposite cell and above inner margin in some specimens; s. t. line arising slightly closer to apex than to origin of t. p. line, prominent in upper part of wing, often becoming reduced or obsolescent below, represented by dark brown cellular spots; terminal line a series of small, dark, intravenular spots, partially obsolete in some specimens; fringe concolorous with wing. Hind wings concolorous with forewings; median shade line weakly represented; discal spot blackish brown, small or minute; extradiscal line obsolete in upper part of wing, narrowly shaded distally by pale line and broader, dark band; s. t. line varying from be-

ing complete to absent; terminal line and fringe like those on forewings.

UNDER SURFACE OF WINGS: Unicolorous pale grayish white, lightly sprinkled with pale brown scales; discal spots dark brown; maculation usually absent, t. p. and s. t. lines weakly indicated in a few specimens.

LENGTH OF FOREWING: 20 to 23 mm.

FEMALE: Similar to male, but more heavily dusted with dark grayish brown scales on a slightly lighter ground color and maculation more strongly represented. Under surface tending to be more heavily covered with dark scales than that of male.

LENGTH OF FOREWING: 17 to 19 mm.

MALE GENITALIA: Uncus evenly tapering, apical portion attenuate, broad, rounded terminally; socius represented by six to eight setae; gnathos swollen medially, terminating in two large, divergent, rugose projections; each valve with costal swelling; valvula without spine patch, but with a few setae on face of valve; processes of valves symmetrical, of equal length, not attaining posterior portion of tegumen, arising from short, wide, tapering base, with small, swollen, capitate piece within folded edge of valve, extending posteriorly as very long, tapering, spinose arm, and with several shorter, thinner spines distally; anellus with rounded base, constricted medially and becoming more heavily sclerotized, expanded distally into short Y-shaped process; tegumen widest posteriorly, saccus U-shaped; aedeagus slightly shorter than combined lengths of uncus, tegumen, and saccus, with tapering, sclerotized projection anteriorly, an elongate, slender anterior end, and with several longitudinal, slightly counterclockwise striations on dorsal surface; vesica unarmed. Abdomen with both sets of tufts on A_3 weakly represented, outer ones shorter and heavier than inner and arising from basal sack-like protuberance; posterior double comb consisting of about 10 to 12 modified, well-spaced setae medially on each side, laterally with numerous setae very closely spaced.

FEMALE GENITALIA: Sterigma represented by narrow convoluted area around sinus vaginalis, extending farther posteriad on dorsal side than on ventral; lamella antevaginalis absent; lamella postvaginalis an elongate, slender, well-sclerotized, rod-like

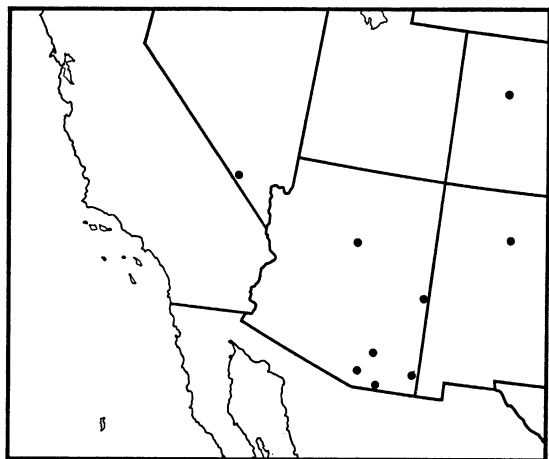


FIG. 2. Distribution of *Melanolophia centralis* McDunnough.

structure, apical portion slightly enlarged and bifurcate medially; ductus bursae very large, rugose, heavily sclerotized, anterior portion tubular, continued posteriorly as sterigma, becoming membranous for short distance before joining corpus bursae ventrally; corpus bursae elongate, very slightly sclerotized and rugose anterior to ductus bursae; signum very small.

EARLY STAGES: Unknown.

FOOD PLANT: Unknown.

TYPE: Holotype, male, in collection of the United States National Museum.

TYPE LOCALITY: Jemez Springs, Sandoval County, New Mexico.

RANGE: Southwestern United States, occurring in Arizona, Colorado, Nevada, and New Mexico (see fig. 2). On the wing in April, May, and June.

REMARKS: Twenty-four specimens and seven genitalic dissections were studied. This species is similar to *imitata* but it is paler in color, and it usually has a more dentate t. p. line, although this character is variable. *Melanolophia centralis* closely resembles *imitata cana*, but it is usually slightly larger and paler. Some specimens of *centralis* are suffused with a dark smoky gray, which tends to obscure the maculation.

The genitalia offer a good means by which to differentiate *centralis* from *imitata*. Both species tend to have the uncus and gnathos of similar shape and to have more or less symmetrical valvular processes. In *centralis* these

processes are symmetrical, and the outer two-thirds is in the form of a slender, tapering, spine-like process, while in *imitata* the processes are capitate, with the one on the right side usually slightly longer. The female genitalia of *centralis* are very distinctive, with the reduced sterigma and the very large and prominent ductus bursae.

***Melanolophia bostar* (Druce), new combination**

Plate 5, figure 5; text figures 37, 123

Tephrosia bostar DRUCE, 1892 (1891-1900), p. 76 (*partim*); 1893 (1881-1900), pl. 48, fig. 13 (male type).

This species is slightly smaller than *imitata*, and the upper surfaces of the wings are a paler grayish brown than those found in that species. The maculation is rather weakly defined, with the exception of the t. p. line and for a dark spot opposite the cell near the wing margin. This species occurs in Mexico and Guatemala.

MALE: Head, vertex grayish brown or pale buff, darker between antennal bases in some specimens; front pale buff, dark brown across top and with small spot on each side by eye; palpi with basal segment pale buff below at base, distally and remaining segments with mixed buff, grayish brown, and brown scales. Thorax grayish brown above, with occasional dark brown scales; below pale buff; legs pale buff, variably spotted with dark brown scales. Abdomen brownish gray, with scattered brown scales, paler at base and below.

UPPER SURFACE OF WINGS: Forewings with ground color pale grayish brown, overlain with scattered ocher, brown, and dark brown scales; cross lines ocher or ochraceous brown, weakly defined; t. a. and median lines tending to be obsolescent; discal spot blackish brown, small; t. p. line weakly defined in upper part of wing, with some blackish brown scales in lower part of wing, tending to be concave between veins M_1 and M_3 , weakly dentate on anal vein, shaded distally with blackish brown above inner margin and weakly with ocher and brown scales in cells M_1 and M_2 ; s. t. line arising nearer apex than to origin of t. p. line, of blackish brown spots, becoming smaller or obsolescent in lower portion of wing, spots in cells M_1 and M_2 tending to be shaded distally with blackish brown; fringe

concolorous with wing. Hind wings concolorous with forewings; median line tending to be nebulous; discal spot blackish brown, small; extradiscal line obsolescent in anterior portion of wing, tending to be shaded distally by a second, less well-defined, ochraceous line; s. t. line weakly represented; fringe like that on primaries.

UNDER SURFACE OF WINGS: Unicolorous pale buff, evenly sprinkled with brown scales; discal spots blackish brown, small; otherwise without definite maculation except for weak indication of s. t. line in upper part of primaries.

LENGTH OF FOREWING: 17 to 20 mm.

FEMALE: Similar to male, but with upper surface of wings tending to have cross lines slightly better defined on a slightly lighter ground color. Under surface tending to have maculation a bit more strongly represented than in male.

LENGTH OF FOREWING: 16 to 21 mm.

MALE GENITALIA: Uncus tapering, posterior one-third with parallel sides, terminating in single point; socius represented by about five or six setae; gnathos swollen medially, terminating in two large, divergent, horn-like projections, recurving apically, their posterior and inner surfaces rugose; each valve with prominent costal tubercle and tuft of elongate setae; valvula with weak spine patch, with long row of elongate setae extending distally; processes of valves asymmetrical, one on right side about twice as long as that on left; right process narrow, slightly sinuous in course, distal one-half with band of closely set setae occupying about one-half of width of process, extending along outer side and curving dorsally to inner side near slightly produced apex, latter thickly covered with fine setae, and extending at least as far as base of uncus; left process extending about three-eighths of length of valve, with narrow, rather weakly sclerotized base, swelling apically into globular, somewhat triangular apical portion, with numerous thickly set, inwardly curving spines along posterior margin, the innermost being thicker than others; anellus narrowed medially from rounded base, expanding posteriorly into a crescent-shaped transverse swelling; tegumen with parallel sides; aedeagus subequal in length to combined lengths of uncus, tegumen, and saccus, with tapering,

sclerotized projection posteriorly, and with several longitudinal, slightly counterclockwise striations on dorsal surface; vesica unarmed. Abdomen with both sets of tufts on A_3 present, outer ones shorter and heavier than inner and apparently arising from basal sack-like protuberance; posterior double comb consisting of about nine or 10 modified, well-spaced setae medially on each side, laterally with numerous setae very closely spaced.

FEMALE GENITALIA: Sterigma with prominent, more or less elliptical genital plate, wider posteriorly, very slender and more heavily sclerotized anterior to sinus vaginalis, anterolateral margins rounded, extending well posteriad of sinus vaginalis; lamella antevaginalis small to moderately large, flap-like, lobate in outline, situated to right of mid-line in some specimens; lamella postvaginalis an elongate, heavily sclerotized projection, about two-thirds of length of apophyses anteriores, asymmetrical, arising on left side, laterally flattened or conical, tapering distally, apex rounded or bifurcate; ductus bursae slender, weakly sclerotized, joining corpus bursae ventrally; corpus bursae elongate, lightly sclerotized and rugose anterior to ductus bursae; signum small.

EARLY STAGES: Unknown.

FOOD PLANT: Unknown.

TYPES: Druce described *bostar* from a number of specimens, and they are not all conspecific. The lectotype is hereby designated as the male specimen, presumably the one illustrated in the "Biologia Centrali-Americana," in the collection of the British Museum (Natural History).

TYPE LOCALITY: San Gerónimo, Guatemala.

RANGE: Guatemala and Mexico (the states of Veracruz, Puebla, and Oaxaca). This species flies from near sea level up to about 5500 feet. The adults have been taken in April, May, June, July, August, October, November, and December. (See Appendix for locality data of specimens examined.)

REMARKS: Forty-five specimens and 19 genitalic dissections were studied. This species is quite distinct from the preceding ones in size, color, and genitalia. It is very closely allied to the following species, and dissections of the genitalia should be examined to make certain of the identification.

The male genitalia can be recognized by the fact that the elongate, slender process of the right valve extends to the base of the uncus or shortly beyond, with the somewhat capitate process of the left valve extending only as far as the anellus. In the female genitalia the lamella postvaginalis is characteristic, as it is asymmetrical, being more on the left than on the right side and tending to be diagonally flattened.

Melanolophia flexilinea (W. Warren),
new combination

Cymatophora flexilinea W. WARREN, 1906, p. 507.

This species occurs from Mexico to Ecuador in three subspecific populations. The northern population is virtually indistinguishable from *bostar* in color and maculation. The population occurring in Costa Rica, Panama, and northern Ecuador is lighter in color and more ochraceous, while the Colombian population is much darker and appears quite distinctive. Genitalic characters are the best criteria by which to distinguish the species.

Melanolophia flexilinea flexilinea (W. Warren)

Plate 5, figure 6; text figures 38, 124

Tephrosia bostar DRUCE, 1892 (1891–1900), p. 76 (*partim*).

Cymatophora flexilinea W. WARREN, 1906, p. 507.

This subspecies, which occurs in Mexico and Honduras, is virtually identical with *bostar* (Druce) in size, color, and maculation. The two are separable by means of the genitalia, with the male affording the best characters in this regard.

MALE: Head, thorax, and abdomen like those of *bostar*.

UPPER SURFACE OF WINGS: Forewings with ground color pale grayish brown, more or less heavily and evenly overlain with brownish gray scales and with scattered dark brown scales; cross lines weakly defined, medium to dark brown, as in *bostar*; t. p. line more or less complete, subparallel with outer margin, with dark brown scales in cells M_1 and M_2 and with brownish black scales forming two spots, in most specimens, above inner margin. Hind wings concolorous with forewings, as in *bostar*.

UNDER SURFACE OF WINGS: Unicolorous

pale buff, evenly and lightly sprinkled with brown scales; discal spots blackish brown, small; otherwise without definite maculation except for weak indication of s. t. line in upper part of primaries and, in some specimens, very faint indications of other cross lines.

LENGTH OF FOREWING: 17 to 20 mm.

FEMALE: Similar to male, but with upper surface of wings tending to be more clearly marked, with cross lines appearing slightly better defined on a slightly paler ground color. Under surface tending to have maculation a bit more strongly represented than in male.

LENGTH OF FOREWING: 17 to 22 mm.

MALE GENITALIA: Very similar to those of *bostar*, differing mainly in processes of valves; both processes of equal length or with right process slightly longer than left one, extending to posterior margin of anellus; right process in fold of sacculus, narrowed medially, enlarged distally into rounded, capitate projection, with numerous posteromedially directed setae arising dorsally across apical portion; left process very similar to right one, tending to have fewer dorsal setae.

FEMALE GENITALIA: Very similar to those of *bostar*, differing mainly in sterigma and lamellae; sterigma with large, prominent, elliptical, genital plate, very narrow anterior to sinus vaginalis, extending well posteriad of sinus vaginalis, with raised median ridge; lamella antevaginalis small to moderately large, flap-like, subtriangular or lobate in outline; lamella postvaginalis an elongate, heavily sclerotized projection, two-thirds of length of apophyses anteriores, extending farther at base on left side than on right, dorsoventrally flattened, tapering medially, slightly swollen apically, with strong median cleft.

EARLY STAGES: Unknown.

FOOD PLANT: Unknown.

TYPE: This species was described from one male and two females; the male (U.S.N.M. No. 9358) is hereby designated as the lectotype.

TYPE LOCALITY: Jalapa, Veracruz, Mexico.

RANGE: Mexico (the states of Veracruz, Oaxaca, and the Distrito Federal) and Honduras. This subspecies has been captured from about 2000 feet to 7300 feet in elevation during the months of March, April, June, August, September, and November. (See Ap-

pendix for locality data of specimens examined.)

REMARKS: Fifty-eight specimens and 15 genitalic dissections were studied. This population is very similar to *bostar*, and both species apparently fly together in the state of Veracruz, as examples of each have been studied that bear Jalapa and Orizaba labels. It is usually necessary to examine the genitalia to make certain of the identification, because the two species closely resemble each other. One difference seems to be that the t. p. line of *bostar* tends to be concave opposite the cell, while in nominate *flexilinea* it is more or less subparallel with the outer margin, but this difference does not exist in every specimen.

In the male genitalia, the processes of the two valves are about equal in length and in shape. The lamella postvaginalis of the female genitalia is only slightly asymmetrically situated, and it is dorsoventrally flattened.

***Melanolophia flexilinea fragosa*, new subspecies**

Plate 5, figure 7

Tephrosia bostar DRUCE, 1892 (1891–1900), p. 76 (*partim*).

This subspecies, which occurs in Costa Rica, Panama, and northern Ecuador, differs from the preceding population in that the wings are more ochraceous and have a more mottled appearance, with the maculation tending to be more clearly indicated.

MALE: Head, thorax, and abdomen like those of preceding subspecies.

UPPER SURFACE OF WINGS: Forewings with ground color pale grayish brown, overlain with ochraceous brown, brownish gray, and dark brown scales and strigations, producing a somewhat mottled or "rough" appearance; cross lines more or less weakly defined, as in preceding subspecies. Hind wings concolorous with forewings, as in preceding subspecies.

UNDER SURFACE OF WINGS: Like that of preceding subspecies.

LENGTH OF FOREWING: 17 to 21 mm.; holotype, 20 mm.

FEMALE: Similar to male, but with upper surface of wings tending to be more clearly marked, with cross lines appearing slightly better defined on a slightly paler ground

color. Under surface tending to have maculation a bit more strongly represented than in male.

LENGTH OF FOREWING: 18 to 22 mm.; allotype, 19 mm.

MALE GENITALIA: Similar to preceding subspecies, but with terminal portion of uncus tending to be slightly more swollen, and with process of right valve longer than that of left valve by distance varying from width of apex of uncus to diameter of aedeagus.

FEMALE GENITALIA: Similar to preceding subspecies, but with posterior portion of sterigma slightly smaller, and with lamella postvaginalis tending to be slightly shorter and with apex rounded or weakly bifurcate.

EARLY STAGES: Unknown.

FOOD PLANT: Unknown.

TYPES: Holotype, male, and allotype, female, Puntarenas, Monteverde, Costa Rica, February 23, 1962, elevation 4600 feet (C. W. Palmer). Paratypes: *Costa Rica*: Same data as types, February 18, 1960, March 16, 1960, April 16, 1960, December 5, 1961, January 1, 17–25, 1962, February 6, 9, 23, 1962, four males, 11 females; Juan Vinas, elevation 2500 feet, January, May, June, November (W. Schaus), six males, five females; San José, May 15 to June 10, 1899, October, 1906, June, 1908, elevation 4000–5000 feet (Underwood; H. Schmidt), two males, 11 females; Cartago, without date and December, 1906, elevation 5000–6000 feet (Underwood), five females; Azalar de Carthago, elevation 5000–6000 feet (Underwood), one female; Sitio, May, three males, one female; Mt. Poas, May, one female; Orosi, elevation 1200 meters (Fassl), seven males, five females; Cachi, September 23 to October 14, 1912, elevation 3300 feet (C. H. Lankester), one male, one female; Tuis, May, one female; San Carlos, June, 1899 (Underwood), one female; Candelaria Mountains (Underwood), one female; no further data (P. Biolley; Underwood), three males, seven females. *Panama*: El Volcan, Chiriqui, February 18, 1936 (Lutz and Gertsch), one male; Chiriqui, five males, one female; V[olcan] de Chiriqui, elevation 2000–4000 feet (Champion), five males, one female, identified as "*Tephrosia bostar* Druce, B. C. A. Lep. Het., Godman-Salvin coll."; Boquete, Chiriqui, elevation 3500 feet (Wat-

son), one female. Also examined, but not included in the type series: Paramba, [Imbabura], Ecuador, one male. The holotype and allotype are in the collection of the American Museum of Natural History; paratypes are in the collections of that institution, of the British Museum (Natural History), and of the United States National Museum.

RANGE: Costa Rica, Panama (the province of Chiriqui), and northern Ecuador (the department of Imbabura). This subspecies is apparently restricted to the mountainous areas, as it has been taken from about 2500 to 6000 feet in elevation. The adults have been captured in January, February, March, April, May, June, September, October, November, and December.

REMARKS: Ninety-four specimens and 23 genitalic dissections were studied. There is some variability in this subspecies, particularly in the specimens from Costa Rica. Almost one-half of the males from that country approach specimens of nominate *flexilinea* in color and maculation, while the remainder resemble examples from Panama. This variability does not seem to be present in the females, as they match specimens from the Panamanian population very well. The single specimen from Ecuador agrees very well in color, maculation, and male genitalia with Panamanian specimens.

In the male genitalia of this subspecies the process of the right valve is longer than that found in the Mexican population. There is variability here, as in six of the specimens studied the right process was about 0.19 mm. longer than the left process, in three it was 0.38 mm. longer, and in the remaining three its length was intermediate between 0.19 and 0.38 mm. In nominate *flexilinea*, 0.07 mm. is the greatest amount by which the right process is longer than the left.

***Melanolophia flexilinea digna* Prout,**
new combination
Plate 5, figure 8

Melanolophia digna PROUT, 1910b, p. 510.

The population that occurs in Colombia is much darker in color than the two preceding subspecies. The pattern is basically the same, although it tends to be represented by ochraceous scales, and the dark patches above the

inner margin and on the s. t. line tend to be rather prominent.

MALE: Head, vertex dull gray; front and palpi like those of preceding subspecies. Thorax and abdomen dull gray, with scattered brown scales above, paler below.

UPPER SURFACE OF WINGS: Forewings with ground color dull gray, overlain with brown and ochraceous brown scales; cross lines rather weakly defined by ochraceous and ochraceous brown scales, represented by costal dots in some specimens, as in preceding subspecies; spots of dark brown and ochraceous brown distal to t. p. line above inner margin and along s. t. line in cells M_1 and M_2 . Hind wings concolorous with forewings, cross lines tending to be emphasized with ochraceous scales in some specimens.

UNDER SURFACE OF WINGS: Unicolorous dull, pale gray, lightly sprinkled with brown scales, with apex of forewings paler; discal spots brownish black, small; without maculation except for slightly darker subterminal band on all wings.

LENGTH OF FOREWING: 20 to 21 mm.

FEMALE: Unknown.

MALE GENITALIA: Similar to nominate *flexilinea*, with processes of both valves of approximately equal length, pointed apical portion of right process extended distally for short distance beyond posteromedially directed, dorsal setae.

FEMALE GENITALIA: Unknown.

EARLY STAGES: Unknown.

FOOD PLANT: Unknown.

TYPE: In the collection of the British Museum (Natural History).

TYPE LOCALITY: Torné, Colombia.

RANGE: Colombia (the departments of Tolima, Valle del Cauca, and Norte de Santander). This species occupies the Highlands Zone. It has been taken at elevations of from 5500 to 7200 feet; specimens have been examined labeled February, June, August, and October. (See Appendix for locality data of specimens examined.)

REMARKS: Ten specimens and three genitalic dissections were studied. The dark gray color of the wings distinguishes this population from either of the two preceding ones.

The extent of the range of this population may be greater than indicated, as the author

could not find several of the localities that were given for the specimens.

***Melanolophia canadaria* (Guenée)**

Tephrosia canadaria GUENÉE, 1857, p. 263.

A rather variable species, with individual and geographic differences in the ground color and in the cross lines. The moths vary from being small and pale gray in the northern part of the range, to being slightly larger and variably suffused with brown in the central area of distribution, and to being still larger and rather heavily marked with dark brown in the south. In addition, various degrees of melanism, ranging from partial to complete, occur in New York, Pennsylvania, and adjacent states. The cross lines are usually rather weakly represented, with the t. p. line more strongly defined, and somewhat sinuous, geminate, and outwardly dentate on the veins. *Melanolophia canadaria* occurs in eastern North America.

***Melanolophia canadaria canadaria* (Guenée)**

Plate 5, figure 9; text figures 3, 125, 154

Tephrosia canadaria GUENÉE, 1857, p. 263. PACKARD, 1874, p. 33; 1876, p. 425 (*partim*). GROTE, 1882, p. 49. ANON., 1882, p. 24. SMITH, 1891, p. 73. HULST, 1895, p. 42. OBERTHÜR, 1913, fasc. 7, p. 281, pl. CLXX, fig. 1668.

Ectropis canadaria: GUMPENBERG, 1892, p. 336 (*partim*).

Melanolophia canadaria: HULST, 1896, p. 357. DYAR, "1902" [1903], p. 326. SMITH, 1903, p. 77. HOLLAND, 1903, p. 344 (*partim*). GROSSBECK, 1917, p. 99 (*partim*). BARNES AND McDUNNOUGH, 1917, p. 118. McDUNNOUGH, 1920b, p. 13, pl. 1, fig. 6 (male genitalia), pl. 10, fig. 1 (venation); 1933, p. 123; 1938, p. 163. FORBES, 1948, p. 60 (*partim*). MCGUFFIN, 1944, p. 125; 1955, p. 42. FERGUSON, 1954, p. 314.

Nominate *canadaria* occurs in the northern part of the range of the species. The moths are pale gray, with a small amount of brown scaling. The cross lines, particularly the t. p. line, are usually fairly well defined.

MALE: Head, vertex with mixed pale gray or pale ocher and brown scales; front pale buff, with dark brown band across top and with grayish brown spots laterally by eyes; palpi grayish brown, with scattered dark brown scales, in some specimens with pale buff scales below at base. Thorax pale gray, pale grayish brown, or pale buff above, with

scattered brown scales, collar slightly darker in some specimens; below pale buff; legs pale buff, variably spotted with light brown and brown scales. Abdomen pale grayish brown above, with scattered brown and pale buff scales; below paler.

UPPER SURFACE OF WINGS: Forewings with ground color pale gray, sparsely overlain with brown, brownish gray, and dark brown scales; cross lines rather weakly defined except for costal spots, with t. p. line usually strongest, medium to dark brown, of basic pattern; t. a. and median lines weak or obsolescent; discal spot blackish brown, small, weakly represented in some specimens; t. p. line geminate opposite cell and above inner margin, inner line usually complete, evenly curved, outer line dentate on veins, in some rather strongly so, the two usually separated by narrow pale line, and slightly shaded distally above inner margin with dark brownish gray or brownish black; s. t. line arising nearer apex than to origin of t. p. line, consisting of four or five blackish brown, outwardly pointed cellular spots in upper portion of wing, narrowly shaded outwardly with pale gray and in cells M_1 and M_2 with brownish gray in some specimens, line obsolescent in middle of wing, usually represented at tornus by one or two dark spots; terminal line a series of black, intravenular spots; fringe concolorous with wing. Hind wings concolorous with forewings; median shade line varying from being complete to being obsolescent; discal spot blackish brown, small; extradiscal line obsolescent in anterior portion of wing, shaded distally by narrow pale line in lower part and, in some specimens, by nebulous, distal, dark shade; s. t. line usually complete, weakly represented in middle of wing in some specimens, appearing to be like that on forewing; dots of terminal line and fringe like those on primaries.

UNDER SURFACE OF WINGS: Unicolorous pale buff or pale gray, evenly sprinkled with brown scales except for inner margin of forewings; discal spots dark brown or brownish black, small; s. t. line more or less heavily represented as nebulous band on forewings, and on some specimens on hind wings; otherwise without maculation in most specimens except for terminal, cellular spots.

LENGTH OF FOREWING: 15 to 18 mm.

FEMALE: Similar to male, but with upper surface of wings tending to be slightly lighter in color, with more clearly defined cross lines. Under surface tending to have maculation slightly more strongly represented than in male.

LENGTH OF FOREWING: 14 to 17 mm.

MALE GENITALIA: Uncus tapering, apical portion slightly swollen, terminating in single point; socius represented by about five to eight setae; gnathos slightly enlarged medially, with small lateral projection on each side; each valve with small costal tubercle and tuft of elongate setae; valvula without spine patch; processes of valves asymmetrical, one on right side slightly longer than that on left; right process elongate, slender, straight or with slight curve near middle, bluntly pointed apically, apex with group of inwardly or posteriorly directed setae, with innermost one thickest, arising dorsally and extending well beyond process, tips of setae extending as far as middle of uncus; left process extending as far as gnathos, very similar to right process; anellus weakly sclerotized, with rounded base, slightly constricted medially, expanded posteriorly into more heavily sclerotized, rounded process; tegumen with parallel sides, saccus U-shaped; aedeagus slightly shorter than combined lengths of uncus, tegumen, and saccus, with tapering, sclerotized projection posteriorly, an elongate, slender anterior end, and with several longitudinal striations on dorsal surface; vesica unarmed. Abdomen with both sets of tufts on A_3 present, outer ones shorter than inner and arising from basal sack-like protuberance; posterior double comb consisting of about 10 or 11 modified, well-spaced setae medially on each side, laterally with numerous setae very closely spaced.

FEMALE GENITALIA: Sterigma with prominent genital plate, slender anterior to sinus vaginalis, anterolateral margins tapering, extending well posteriad of sinus vaginalis; lamella antevaginalis very large, subequal in length to length of apophyses anteriores, very broad, widest anteriorly, tapering posteriorly, deeply cleft posteriorly for about one-third of length; lamella postvaginalis a weakly sclerotized elongate projection, often weakly bifurcate at apex, shorter than lamella antevaginalis; ductus bursae slender, weakly

sclerotized, joining corpus bursae ventrally; corpus bursae elongate, lightly sclerotized and rugose anterior to ductus bursae; signum very small.

EARLY STAGES: The early stages have been described by McDunnough, and the posterior abdominal segments of the pupa were illustrated (1933, fig. 2). McGuffin (1944, 1955) described the last instar larva in greater detail and illustrated the mandible (1944, fig. 2a).

FOOD PLANTS: Forbes (1948) stated that the larvae are presumably on conifers, while Ferguson (1954) said that they are apparently general feeders on deciduous trees. The results of McDunnough (1933) and McGuffin (1944, 1955) agree with the latter statement. A considerable number of food plants have been reported, although possibly some of them may be referable to *signataria*. The list includes *Acer*, *Betula*, *Chamaenerion*, *Corylus*, *Impatiens*, *Larix*, *Myrica*, *Picea*, *Pinus*, *Polygonum*, *Prunus*, *Quercus*, *Rhus*, *Tilia*, *Tsuga*, and *Ulmus*.

TYPE: In the collection of the United States National Museum.

TYPE LOCALITY: Canada.

RANGE: Southern Canada (Manitoba to Nova Scotia) and the northern United States (Wisconsin to New England). (See fig. 3.) On the wing from April through July, and September.

REMARKS: Fifty-seven specimens and three genitalic dissections were examined. The color of the upper surface of the wings is a characteristic pale gray, with only small amounts of brown scaling. The population is quite uniform in this coloration, and the specimens are usually easy to recognize.

The male genitalia are recognized by the fact that the processes of the valves are approximately equal in size and shape, with the right one tending to be slightly longer. The swollen uncus and the broadly separated projections of the gnathos are also characteristic. The weakly sclerotized but very long and slender lamella postvaginalis is sometimes rather difficult to find in genitalic dissections, but it is distinctive for this species.

***Melanolophia canadaria crama*, new subspecies**

Plate 5, figure 10; text figures 3, 39

Tephrosia canadaria: PACKARD, 1874, p. 33;

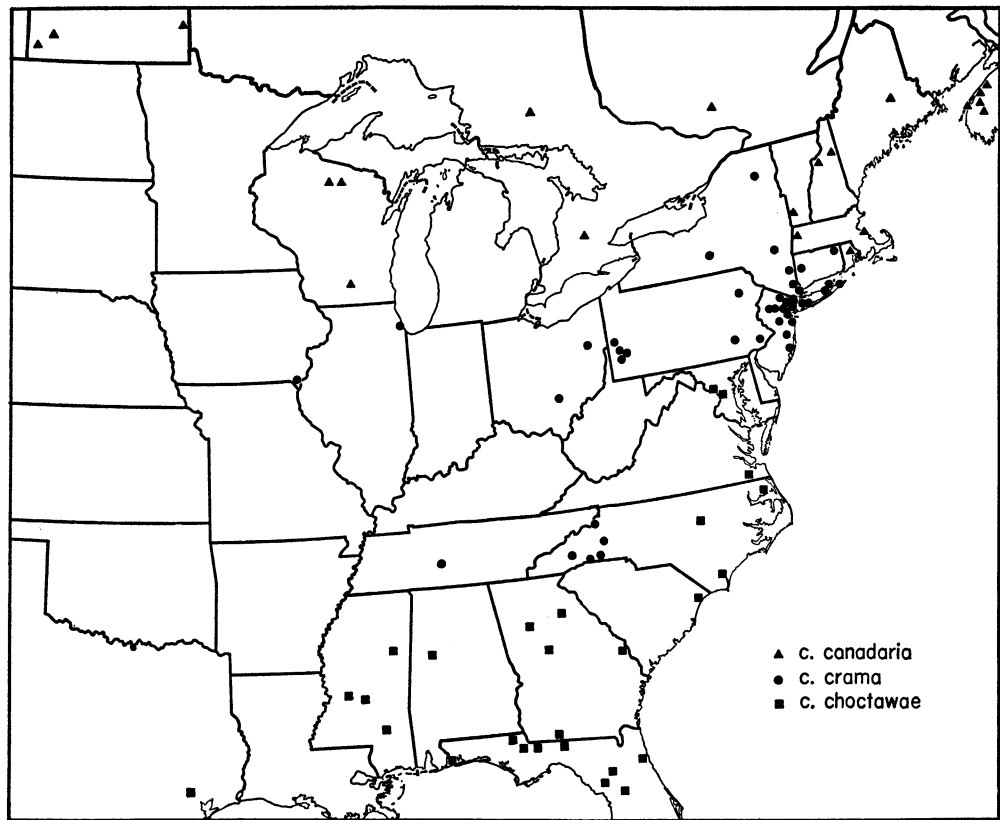


FIG. 3. Distribution of *Melanolophia canadaria* (Guenée).

1876, p. 425 (*partim*), pl. 11, fig. 14. BRUCE, 1887, p. 49. BEUTENMÜLLER, 1890, p. 222.

Ectropis canadaria: GUMPPENBERG, 1892, p. 336 (*partim*).

Melanolophia canadaria: SMITH, 1910, p. 504. HOLLAND, 1903, p. 344, pl. 44, fig. 7. GROSSBECK, 1917, p. 99 (*partim*). FORBES, 1928, p. 603; 1948, p. 60 (*partim*). JONES AND KIMBALL, 1943, p. 115. TIETZ, [1952], p. 136.

Melanolophia (sic!) canadaria: BRITTON, 1920, p. 118.

Melanolophia signataria ab. *carbonata* CASSINO AND SWETT, 1923, p. 13. New combination and new synonymy.

This subspecies occurs south of nominate *canadaria* in the middle states of eastern United States. It is about the same size as, or slightly larger than, nominate *canadaria*, and the upper surface of the wings is more or less heavily overlain with brown, dark brown, or blackish brown scales. Melanic individuals occur in this population.

MALE, NORMAL FORM: Head, thorax, and

abdomen like those in nominate subspecies, but tending to be more heavily marked with brown scales.

UPPER SURFACE OF WINGS: Forewings with ground color pale gray, evenly and heavily overlain with brown, brownish gray, and dark brown scales; maculation like that in nominate subspecies.

UNDER SURFACE OF WINGS: Similar to that of nominate subspecies but more heavily overlain with brown scales.

MELANIC FORM: Head, thorax, and abdomen black or blackish brown, with a few light gray scales posteriorly on thorax and at wing bases, and on posterior margins of abdominal segments; front pale buff in lower portion; thorax and abdomen paler below.

UPPER SURFACE OF WINGS: Ground color of all wings unicolorous black or blackish brown; maculation usually absent, although s. t. line may be weakly indicated in some specimens.

UNDER SURFACE OF WINGS: All wings unicolorous black or grayish black; without maculation.

LENGTH OF FOREWING: 15 to 19 mm.; holotype, 18 mm.

FEMALE, NORMAL FORM: Similar to normal male, but with upper surface of wings tending to be slightly lighter in color, with more brown scales, and with more clearly defined cross lines. Under surface tending to have maculation slightly more strongly represented than in male.

MELANIC FORM: Similar to melanic male.

LENGTH OF FOREWING: 14 to 17 mm.; allotype, 17 mm.

MALE GENITALIA: Like those of nominate *canadaria*.

FEMALE GENITALIA: Like those of nominate *canadaria*.

EARLY STAGES: Not described.

FOOD PLANTS: Probably similar to those of nominate *canadaria* (Bruce, 1887; Beutenmüller, 1890).

TYPES: Holotype, male, Lyons Farms, Union County, New Jersey, April 26 (Frederick Lemmer); allotype, female, Orange Mountains, Union County, New Jersey, May 8. Paratypes, all from New Jersey, and listed by counties: *Bergen County*: Fort Lee district (H. Wormsbacher), one male; Oakland, May 3, 1949 (C. P. Kimball), one female. *Essex County*: Caldwell, three males and six females; Hemlock Falls, April 20, 1902, March 29, 1903, April 12, 1903, April 20, 29, three males and four females; Irvington, July 7, 17, August 18 (F. Lemmer), three males; Millburn, April 30, one male; Montclair, April 23, 1899 (W. D. Kearfott), one female; Montclair Heights, April 28, one male; Newark, April 29, May 3 (W. H. Broadwell), two females; Nutley, July, 1920 (G. H. H. Tate), one male; no further data, July 16, 1899 (W. D. Kearfott), April 28, two females. *Hudson County*: Arlington, July 25 (C. Rummel), one male; Hoboken, one male. *Middlesex County*: New Brunswick, May 6, one male. *Monmouth County*: Atlantic Highlands, July 26, 1908, one female. *Morris County*: Chester, July 23, one male; Green Village, May 2 (C. Rummel), one female; Mendham, July 16, 1934, March 21, 1935, April 26, 1935 (V. H. dos Passos), May 12, 1934, July 8, 1934, July 10, 1935 (G. H. H.

Tate), six males. *Ocean County*: Lakehurst, July 26–31 (F. Lemmer), one male; Manahawkin, July 28–30, 1958 (L. M. Sanford), one male; no further data, July 13, 1949, July 24, 1951, May 15, 1952, July 13, 1955 (O. Buchholz), four males, one female. *Passaic County*: Great Notch, May 8 (C. Rummel), one female; Paterson, April 3, 20, 26, May 1, June 21, July 25, three males, four females; no further data, one male. *Union County*: Elizabeth, April 28, May 5 (W. H. Broadwell), one male, one female; Lyons Farms, April 26, 29, May 3, 5, 8, July 14 (F. Lemmer), five males, four females; Orange Mountains, April 20, 24, three males; no further data, April 29, 1941, July 12, 14, 19, 1941, July 9, 1951 (O. Buchholz), May 3, 4, 9, 14 males, 11 females. The holotype and allotype are in the collection of the American Museum of Natural History; paratypes are in the collection of that institution and of the United States National Museum.

The unique female type of aberration *carbonata* Cassino and Swett is in the collection of the United States National Museum; it is from New Brighton, Beaver County, Pennsylvania.

RANGE: Eastern United States, from Connecticut and New York, south through New Jersey and Pennsylvania, to North Carolina in the Appalachian Mountains, and west to Illinois and Iowa (along the Missouri River). (See fig. 3.) On the wing from March through August and September, rarely taken as late as November.

REMARKS: Four hundred and forty-nine specimens and 23 genitalic dissections were studied. This subspecies has darker-colored wings than are found in the nominate subspecies, and melanic specimens occur in this population. Specimens of the latter have been examined from the states of Connecticut, New York, New Jersey, and Pennsylvania, and some are included in the paratype series. Various degrees of melanistic suffusion occur, so that the coloration of the wings varies from a light brownish black to an almost pure black. The earliest year in which a melanic specimen was seen is 1935 for a male from Pittsburgh, Pennsylvania. The melanistic moths from the New York City area date from 1941; those from Connecticut, from 1951. Unfortunately many of the melanics do

not have the year given on the label, so this information has been lost. An examination of the genitalia of aberration *carbonata* proves that it is properly referred to this species. In conformance with the provision of the International Code of Zoological Nomenclature, the name of this infraspecific form is not used for this population.

***Melanolophia canadaria choctawae*,
new subspecies**

Plate 5, figure 11; text figure 3

Tephrosia canadaria: PACKARD, 1876, p. 425 (*partim*).

Ectropis canadaria: GUMPPENBERG, 1892, p. 336 (*partim*).

Melanolophia canadaria: GROSSBECK, 1917, p. 99 (*partim*). FORBES, 1948, p. 60 (*partim*). PETERSON, 1961, p. 112, pl. 3, fig. 21 (eggs); 1962, p. 117, pl. 2, fig. 16 (eggs).

In the coastal plains of the southeastern United States and in the Gulf states, *canadaria* is represented by a larger and darker population. The maculation is fairly distinct, and melanic specimens are not known.

MALE: Head, thorax, and abdomen like those of nominate subspecies but heavily suffused with brown and dark brown scales.

UPPER SURFACE OF WINGS: Forewings with ground color gray or dark gray, heavily overlain with brown, dark brown, and brownish black scales; maculation like that of nominate subspecies.

UNDER SURFACE OF WINGS: Similar to nominate subspecies but more heavily overlain with dark brown and dark grayish brown scales on darker gray background.

LENGTH OF FOREWING: 17 to 20 mm.; holotype, 18 mm.

FEMALE: Similar to male, but with upper surface of wings tending to be slightly lighter in color, with more blackish brown scales, and with more clearly defined cross lines. Under surface tending to have maculation slightly more strongly represented than in male.

LENGTH OF FOREWING: 16 to 18 mm.; allotype, 17 mm.

MALE GENITALIA: Like those of nominate *canadaria*.

FEMALE GENITALIA: Like those of nominate *canadaria*.

EARLY STAGES: Not described. Peterson

(1961, 1962) has published photographs of the eggs of this population.

FOOD PLANT: Unknown.

TYPES: Holotype, male, Clinton, Hinds County, Mississippi, February 13, 1959; allotype, female, same data, March 31, 1960, both from the collection of Bryant Mather. Paratypes, all from Mississippi, and listed by counties: *Forest County*: Hattiesburg, October 1-15, 1944 (C. D. Michener), one female. *Hinds County*: Clinton, February 7, 12, 13, 14, 1959, March 4, 17, 1959, April 9, 10, 1959, May 17, 1959, March 22, 1960, April 2, 10, 1960, May 28, 1960, June 3, 5, 15, 1960, March 11, 1961, September 9, 16, 1961, February 17, 18, 24, 1962, May 16, 19, 1962, June 9, 1962, July 15, 16, 1962, August 1, 15, 1962, 27 males, four females; Jackson, June 20, 1959, August 8, 9, 1959, July 9, 1960 (M. and E. Roshore), May 12, 19, 1962, five males, one female. *Oktibbeha County*: Agricultural College, July 23, 1920 (F. H. Benjamin), one male. *Rankin County*: Camp Wahi, April 3, 1960, three males. The holotype and allotype are in the collection of the American Museum of Natural History; paratypes are in the collection of that institution, of the United States National Museum, and of B. Mather.

RANGE: Southeastern United States, from the District of Columbia south along the coastal regions to northern Florida and west to Mississippi and eastern Texas, with single specimens known from Arkansas (without additional data) and reported from New Orleans, Louisiana (Packard, 1876). (See fig. 3.) This subspecies occurs primarily in the coastal plains area, and it is on the wing from February through October.

REMARKS: Seventy-five specimens and nine genitalic dissections were studied. This is the largest and darkest population of *canadaria*, and in appearance the specimens are very distinct from the nominate population.

***Melanolophia signataria* (Walker)**

Boarmia signataria WALKER, 1860, p. 350.

This species is very similar to *canadaria*. Many specimens of *signataria* tend to be a little browner and to have a straighter and slightly heavier t. p. line on the upper side of the primaries than do those of the previous species. The safest way to separate the

two is by means of the genitalia. *Melanolophia signataria* occurs in eastern North America in two subspecific populations.

***Melanolophia signataria signataria* (Walker)**

Plate 5, figure 12; text figures 4, 40, 126

Boarmia signataria WALKER, 1860, p. 350. HULST, 1895, p. 42 (synonym of *canadaria*).

Melanolophia signataria: DYAR, "1902" [1903], p. 326. BARNES AND McDUNNOUGH, 1917, p. 118. McDUNNOUGH, 1920b, p. 13, pl. 1, figs. 3, 8 (male genitalia) (valid species); 1938, p. 163. PROCTER, 1938, p. 239; 1946, p. 277. JONES AND KIMBALL, 1943, p. 115. MCGUFFIN, 1944, p. 124. FORBES, 1948, p. 60. TIETZ, [1952], p. 136. FERGUSON, 1954, p. 314, pl. 16, fig. 1.

Boarmia ? ejectaria WALKER, 1860, p. 489. HULST, 1895, p. 72 (synonym of *Anacamptodes humaria* Guenée). BARNES AND McDUNNOUGH, 1916, pp. 39, 41 (synonym of *canadaria*).

Selidosema ejectaria: DYAR, "1902" [1903], p. 325.

Melanolophia ejectaria: BARNES AND McDUNNOUGH, 1917, p. 118. McDUNNOUGH, 1920b, p. 13 (synonym of *signataria*).

Boarmia ? patularia WALKER, 1861, p. 39. BARNES AND McDUNNOUGH, 1916, pp. 39, 41 (synonym of *canadaria*).

Melanolophia patularia: BARNES AND McDUNNOUGH, 1917, p. 118. McDUNNOUGH, 1920b, p. 13 (synonym of *signataria*).

Nominate *signataria* occurs in southeastern Canada and the eastern United States. The moths have pale brown wings, with fairly distinct cross lines.

MALE: Head, thorax, and abdomen similar to those of *canadaria crama*.

UPPER SURFACE OF WINGS: Forewings with ground color pale gray, pale grayish brown, or pale buff, more or less evenly overlain with brown scales and striations; cross lines rather weakly defined except for t. p. line, medium to dark brown; maculation similar to that of *canadaria*, with t. p. line tending to be straighter. Hind wings concolorous with forewings; similar to those of *canadaria* but with extradiscal line tending to be straighter.

UNDER SURFACE OF WINGS: Unicolorous pale buff or pale gray, evenly sprinkled with brown scales except for inner margin of forewings, and with hind wings more lightly dusted; discal spots dark brown or blackish brown, small; maculation usually obsolescent, but with upper part of t. p. and s. t. lines of primaries indicated in some specimens.

LENGTH OF FOREWING: 15 to 19 mm.

FEMALE: Similar to male, but more heavily dusted with brown and dark brown scales, and with maculation more strongly represented. Under surface tending to be more heavily covered with dark scales, and with maculation slightly more strongly represented than in male.

LENGTH OF FOREWING: 15 to 18 mm.

MALE GENITALIA: Uncus tapering, apical portion attenuate, terminating in single point; socius represented by about four or five setae; gnathos enlarged medially, as wide as base of uncus, with widely separated, lateral projections and small median ridge extending posteriorly; each valve with costal swelling; valvula without spine patch; processes of valves asymmetrical, one on left side longer than that on right; right process straight or slightly curved, of even width, curved inwardly at apex, with row of several posteriorly directed spines on inner margin, process extending as far as gnathos; left process extending beyond end of uncus, slender, straight or slightly curved, apex gently curved inwardly, with narrow band of short, appressed setae on outer side, expanding at apex to cover dorsal surface and extending beyond tip of process; anellus weakly sclerotized, with truncate base, constricted medially, expanded posteriorly into more heavily sclerotized, broadened process; tegumen with parallel sides, saccus U-shaped; aedeagus slightly longer than combined lengths of uncus, tegumen, and saccus, with heavily sclerotized, elongate, tapering projection posteriorly, an elongate, slender, capitate anterior end, with several longitudinal striations on dorsal surface; vesica unarmed. Abdomen with both sets of tufts on A_3 weakly represented, outer ones shorter and heavier than inner and arising from basal sack-like protuberance; posterior double comb consisting of about 10 or 11 modified, well-spaced setae medially on each side, laterally with numerous setae very closely spaced.

FEMALE GENITALIA: Sterigma with large, weakly sclerotized genital plate, slender anterior to sinus vaginalis, anterolateral margins rounded, extending well posteriad of sinus vaginalis, truncate posteriorly; lamella antevaginalis very large, subequal

in length to length of apophyses anteriores, broad, constricted basally, lateral margins rounded, indented posteriorly for about one-eighth to one-fifth of length; lamella postvaginalis elongate, slender, well sclerotized, rod-like, swollen apically and with posterior margin indented medially, extending beyond lamella antevaginalis; ductus bursae slender, membranous, joining corpus bursae ventrally; corpus bursae elongate, lightly sclerotized and rugose anterior to ductus bursae; signum very small.

EARLY STAGES: McGuffin has described and figured the ultimate instar of the larva and illustrated the mandible (1944, figs. 1, 2b).

FOOD PLANTS: *Abies*, *Betula*, *Larix*, and *Picea* (McGuffin, 1944). Ferguson (1954) reared the larvae on *Tilia* from eggs, but the moths did not emerge.

TYPES: Of *signataria*, in the British Museum (Natural History). Walker described

this species from four specimens, and a male is hereby designated as the lectotype. The names *ejectaria* and *patularia* represent but a single specimen, according to McDunnough (1916); this male is in the Canadian National Collection at Ottawa.

TYPE LOCALITIES: Nova Scotia (*signataria*); Canada (*ejectaria*); Sixteen Island Lake, Valley of the River Rouge (*patularia*).

RANGE: Southeastern Canada (Ontario to Nova Scotia) and the eastern portion of the United States (Nebraska, Iowa and Wisconsin to Maine, south to Mississippi, North Carolina, and South Carolina). (See fig. 4.) On the wing in March, April, May, June, July, and August.

REMARKS: Two hundred and fifty-ninespecimens and 10 genitalic dissections were studied. The adults of *signataria* are very similar to those of *canadaria*. In general the present species tends to be slightly paler and more suffused with brown scales, and to have

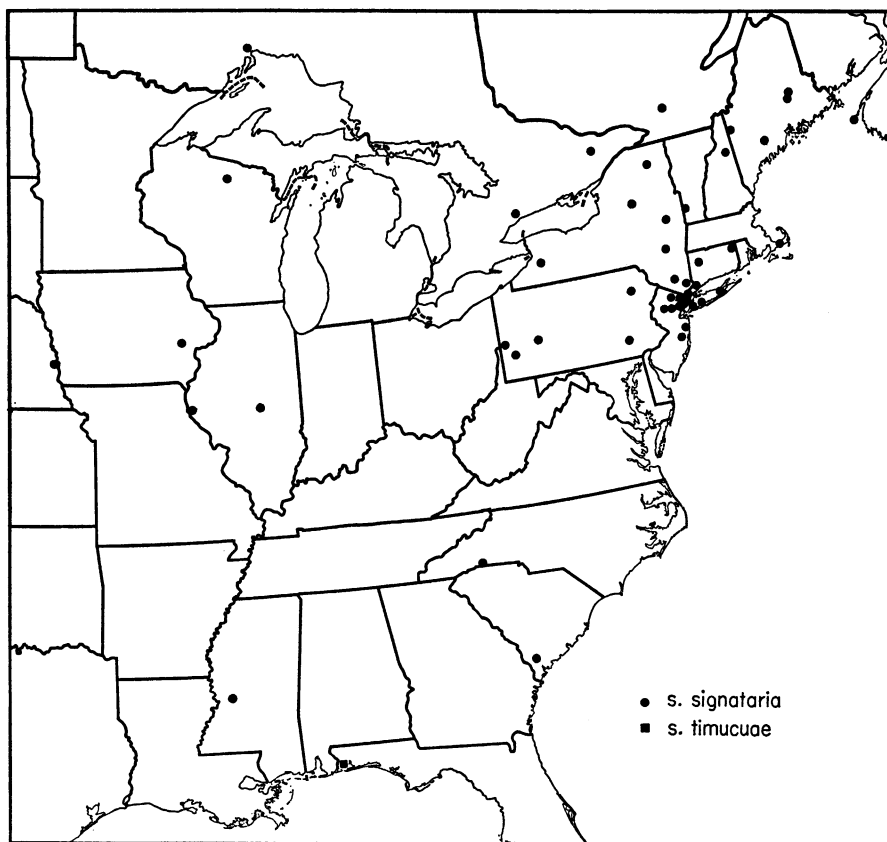


FIG. 4. Distribution of *Melanolophia signataria* (Walker).

the t. p. line simple, straighter, and slightly more strongly represented. No melanic specimens of this species are known; *carbonata* is referable to *canadaria*. The safest way to make a determination of these two species is to examine the genitalia.

There will be no difficulty in distinguishing the male genitalia, as the valvular processes in *canadaria* are more or less of even length, or the right one is slightly longer than the left, whereas in *signataria* the left process is considerably longer than the right one. The female genitalia of these two species are similar, but those of *signataria* can be recognized by the very long, slender, well-sclerotized, rod-like lamella postvaginalis.

It is possible that *signataria* is more widespread than we realize. A great many dates of capture are in April and May, when most collectors are not yet active. More early spring collecting is needed to obtain additional specimens of this species.

***Melanolophia signataria timucuae*, new subspecies**

Plate 5, figure 13; text figure 4

The wings of the adults are dark brown, and the maculation is obsolescent or weakly represented. This population occurs in western Florida.

MALE: Head, thorax, and abdomen similar to those of nominate *signataria* but tending to be slightly darker.

UPPER SURFACE OF WINGS: Forewings with ground color blackish brown (holotype) or dark brown (paratypes), with a few scattered blackish brown scales; cross lines weakly defined or obsolescent, as in nominate *signataria*. Hind wings concolorous with forewings; similar to those of nominate *signataria*.

UNDER SURFACE OF WINGS: Unicolorous dark gray or brownish gray, evenly sprinkled with dark brown scales except for paler inner margin of forewings, and with hind wings more lightly dusted; maculation absent or obsolescent except for all discal spots.

LENGTH OF FOREWING: 18 to 20 mm.; holotype, 20 mm.

FEMALE: Unknown.

MALE GENITALIA: Like those of nominate *signataria* but with process of left valve extending to, or slightly beyond, end of valve.

FEMALE GENITALIA: Unknown.

EARLY STAGES: Unknown.

FOOD PLANT: Unknown.

TYPES: Holotype, male, Pensacola, [Escambia County], Florida, February, 1961 (Shirley Hills). Paratypes: Florida: Same data as holotype, March, 1961, March 9, 1962, two males. The holotype is in the collection of the American Museum of Natural History; paratypes are in the collections of that institution and of Mrs. Hills.

RANGE: Western Florida, known only from the type locality in February and March (see fig. 4).

REMARKS: Three specimens and two genitalic dissections were studied. The members of this population can be distinguished from nominate *signataria* by the much darker wings and by their larger size.

In the male genitalia, the process of the left valve is longer than that found in nominate *signataria*, as it extends to, or shortly beyond, the end of the valve. In the dissection of a male from Hinds County, Mississippi, the process of the left valve is longer than the valve, which indicates a placement with *timucuae*. However, the moth itself is small and pale; consequently it fits much better with nominate *signataria* than with the Floridian subspecies.

***Melanolophia imperfectaria* (Walker)**

Tephrosia imperfectaria WALKER, 1860, p. 407.

This species is closely allied to *signataria*, and the two are similar in appearance. The present species occurs in two populations, the northern being larger and darker than *signataria*, with more poorly represented cross lines in the male. The southern population is smaller and paler. The species occurs in southern Texas and in Mexico.

***Melanolophia imperfectaria imperfectaria* (Walker)**

Plate 5, figure 14; text figures 41, 127

Tephrosia imperfectaria WALKER, 1860, p. 407. HULST, 1895, p. 42 (synonym of *canadaria*).

Melanolophia imperfectaria: DYAR, "1902" [1903], p. 326. BARNES AND McDUNNOUGH, 1917, p. 118. McDUNNOUGH, 1920b, p. 13, pl. 1, fig. 5 (male genitalia), pl. 7, fig. 4 (male) (valid species); 1938, p. 163.

The northern subspecies is larger and of a darker brown than *signataria*, and the maculation tends to be slightly more clearly repre-

sented. This subspecies occurs in southern Texas.

MALE: Head, thorax, and abdomen similar to those of *signataria*, but tending to be slightly darker.

UPPER SURFACE OF WINGS: Forewings with ground color pale brownish gray, heavily and evenly overlain with brown scales; cross lines weakly represented, similar to those of *signataria* as far as can be seen, t. a. and median lines obsolescent in most specimens, in some represented by costal spots and weak shade line; discal spot blackish brown, small, obsolescent in some specimens; t. p. line weakly indicated in upper and lower parts of wing, obsolescent in middle, weakly to moderately shaded distally in many specimens opposite cell and above inner margin by brown or brownish black scales; s. t. line arising nearer apex than to origin of t. p. line, represented by a few dark cellular spots in upper part of wing, and in some specimens above tornus, those in cells M_1 and M_2 usually strongest; terminal line a series of small, black, intravenular dots; fringe concolorous with wing. Hind wings concolorous with forewings; median shade line varying from being weak to being moderate in strength; discal spot usually absent, in some cases weakly represented; extradiscal line obsolescent in anterior part of wing, becoming stronger posteriorly, shaded distally by narrow, pale line and second rather nebulous dark line, tending to be outwardly dentate on veins; s. t. line a complete series of cellular spots; dots of terminal line very small or absent; fringe like that on primaries.

UNDER SURFACE OF WINGS: Unicolorous pale gray, evenly sprinkled with brown scales and strigations except for inner margin of forewings, and with hind wings tending to be more lightly dusted; discal spots small or obsolescent; maculation usually obsolescent except for weak subterminal band in some specimens.

LENGTH OF FOREWING: 18 to 19 mm.

FEMALE: Similar to male, but more heavily dusted with dark brown scales on lighter ground color, and with maculation more strongly represented. Under surface tending to be more heavily covered with dark scales, and with maculation slightly more strongly represented than in male.

LENGTH OF FOREWING: 16 to 18 mm.

MALE GENITALIA: Uncus tapering, with sides slightly concave, apex with slender terminal ridge; socius represented by eight to 12 setae; gnathos enlarged medially, terminating in two large, divergent, well-separated processes; each valve with costal tubercle and tuft of elongate setae; valvula with spine patch absent; processes of valves asymmetrical, one on left side longer than that on right; right process slender, slightly S-shaped, with dense patch of posteriorly curving setae before apex on dorsal side, the process not reaching posterior portion of tegumen; left process extending to middle of or beyond end of uncus, an elongate blade-like arm, tapering at apex, with band of short, appressed setae arising on outer side before middle, curving to dorsal surface and extending to apex; anellus weakly sclerotized, with truncate base, sharply constricted medially, expanded posteriorly into more heavily sclerotized, broadened process; tegumen with parallel sides, saccus U-shaped; aedeagus longer than combined lengths of uncus, tegumen, and saccus, with heavily sclerotized, elongate, tapering projection posteriorly, an elongate, slender anterior end, and with several longitudinal, slightly counterclockwise striations on dorsal surface; vesica unarmed. Abdomen with both sets of tufts on A_3 present, inner consisting of two parts, outer shorter and heavier, arising from basal sack-like protuberance; posterior double comb consisting of about 11 modified, well-spaced setae medially on each side, laterally with numerous setae very closely spaced.

FEMALE GENITALIA: Sterigma with large, weakly sclerotized genital plate, slender anterior to sinus vaginalis, anterolateral margins rounded, extending well posteriad of elliptical, thickly rimmed sinus vaginalis; lamella antevaginalis very large, subequal in length to length of apophyses anteriores, broad, constricted basally, lateral margins rounded, indented posteriorly for about one-eighth to one-tenth of length; lamella postvaginalis elongate, slender, weakly sclerotized, apex not swollen and weakly indented, extending about as far as posterior margin of lamella antevaginalis; ductus bursae sclerotized, sharply tapering from base of lamella antevaginalis, joining corpus bursae ven-

trally; corpus bursae elongate, lightly sclerotized and rugose anterior to ductus bursae; signum very small.

EARLY STAGES: Unknown.

FOOD PLANT: Unknown.

TYPE: Walker described *imperfectaria* from a single female, and it is now in the collection of the British Museum (Natural History).

TYPE LOCALITY: East Florida.

RANGE: Southern Texas. No material has been found from the Gulf states or from Florida that is referable to this species. On the wing in February, March, and May.

REMARKS: Ten specimens and four genitalic dissections were examined. This subspecies is very much like *signataria*, although the two do not occur in the same area. Nominate *imperfectaria* tends to be slightly larger, to be a darker brown, and to be more immaculate.

No Florida material has been examined that can be referred to this species. We are assuming that the data on Walker's type were accurate and that the type specimen belongs to the northern population.

The processes of the valves in *signataria* and *imperfectaria* are basically similar, although the right process of the latter species tends to be shorter than that in *signataria*. One good way to separate the male genitalia of the two species is by the gnathos which, in the present species, has two very large and prominent lobes that are separated by a deep cleft, while in *signataria* the lobes are much smaller and are widely separated. The female genitalia of these two species are closely similar. In *imperfectaria* the ductus bursae is more heavily sclerotized and more sharply tapering than in *signataria*, the basal portion of the lamella antevaginalis tends to be more slender, with the maximum width being about in the middle of the process, and the lamella postvaginalis is only lightly sclerotized.

***Melanolophia imperfectaria solida*, new subspecies**

Plate 5, figure 15

The Mexican subspecies is smaller than the preceding population, and the males have grayish brown, almost immaculate, wings. The females tend to have grayish brown wings, with the maculation not so contrast-

ing as in the Texas population of *imperfectaria*.

MALE: Head, thorax, and abdomen like those of nominate subspecies.

UPPER SURFACE OF WINGS: Forewings with ground color pale grayish brown, lightly overlain with brown and brownish gray scales; cross lines usually absent in most specimens, in some represented by small costal spots; t. p. line present above inner angle only in most specimens, rarely weakly represented opposite cell; s. t. line weakly indicated opposite cell; terminal line very weak or absent.

UNDER SURFACE OF WINGS: Like that of nominate subspecies.

LENGTH OF FOREWING: 16 to 18 mm.; holotype, 17 mm.

FEMALE: Similar to male, but more heavily dusted with brown and grayish brown scales on grayish brown ground color; otherwise like nominate subspecies.

LENGTH OF FOREWING: 15 to 20 mm.; allotype, 16 mm.

MALE GENITALIA: Similar to those of nominate subspecies, but with apex of process of right valve scarcely extending beyond terminal spining, and with process of left valve thinner.

FEMALE GENITALIA: Similar to those of nominate subspecies, but with sterigma tending to be more circular, and with lamella antevaginalis slightly shorter and broader.

EARLY STAGES: Unknown.

FOOD PLANT: Unknown.

TYPES: Holotype, male, and allotype, female, Guadalajara, [Jalisco], Mexico. Paratypes, all from Mexico: Same data as types, one female, November–December, 1893 (P.H. Goldsmith), three males, three females; Orizaba, [Veracruz], one male, March, 1913, one female; Oaxaca, one female; Cinchena December 31, 1898, one male; Region de Cordoba, 1901–1903 (L. Conradt), three females; Cerro Azul, Veracruz, July 3, 1926 (C. C. Hoffmann), one female. The holotype and allotype are in the collection of the United States National Museum; paratypes are in the collections of that institution, of the British Museum (Natural History), and of the American Museum of Natural History.

RANGE: Mexico (the states of Veracruz, Jalisco, and Oaxaca). This subspecies has been taken from about 700 to 5400 feet in

elevation, in the months of March, July, October, November, and December.

REMARKS: Seventeen specimens and seven genitalic dissections were examined. This subspecies is smaller and paler than the nominate population. In addition to these differences, variations in genitalic structures are also present. This population possibly should be given specific status, but it is being placed as a subspecies, more clearly to indicate its relationships and the degree of differentiation that is found here.

***Melanolophia fimbriata*, new species**

Plate 5, figure 16; text figures 42, 128

This is a small to medium-sized species, with ochraceous or brownish ochraceous wings, tending to become slightly darker beyond the t. p. line. The t. p. and s. t. lines are more or less complete, the spots of the latter tend to be bordered distally by white, and there is dark scaling opposite the cell. The genitalia have good specific characters. This species has been taken in Costa Rica, Panama, and Ecuador.

MALE: Head, vertex pale grayish brown, with scattered brown and pale brown scales; front pale buff, with dark brown band across top and paler brown spots laterally by eyes; palpi pale buff, second and third segments with brown and dark brown scaling laterally. Thorax pale grayish brown above, with scattered brown scales, collar slightly darker, with indistinct transverse band on patagia; below pale buff; legs pale buff, variably spotted with light and dark brown scales above, slightly paler below.

UPPER SURFACE OF WINGS: Forewings with ground color pale buff or pale ochraceous brown, more or less evenly overlain with dark brown scales; cross lines weakly represented basally, usually with distinct t. p. and s. t. lines; t. a. and median lines arising from costal spots, former angled in cell, median line straight in most specimens; discal spot blackish brown, round, situated in slightly paler median area; t. p. line complete, rarely becoming obsolescent in middle of wing, shaded distally in upper part of wing and above inner angle by brown and dark brown scales, these being strongest opposite cell and separated from t. p. line by narrow band of ground color, tending to be outwardly den-

tate on veins, strongly so in some specimens; s. t. line consisting of brownish black cellular spots, outlined distally by grayish white scales in some specimens, with spots in cells M_2 and M_3 shaded distally by brownish black; terminal line of small, black, intravenular spots; fringe grayish black, of ground color opposite veins. Hind wings concolorous with forewings; median shade line broad, rather weakly represented in some examples; discal spot blackish brown, round; extradiscal line obsolescent in anterior part of wing, becoming stronger posteriorly, shaded distally by narrow, pale line and a second darker and broader band; s. t. line, terminal line, and fringe like those on primaries.

UNDER SURFACE OF WINGS: Unicolorous grayish ocher, evenly overlain with dark gray or grayish brown scales and strigations except for paler inner margin of forewings, and with hind wings tending to be slightly paler; discal spots small or moderate; maculation usually reflected from upper surface in form of broad s. t. band on all wings and narrower indications of other cross lines.

LENGTH OF FOREWING: 16 to 20 mm.; holotype, 20 mm.

FEMALE: Similar to male, but with upper surface of wings tending to be more strongly overlain with brown scales and with maculation tending to be less clearly defined.

LENGTH OF FOREWING: 14 to 20 mm.; allotype, 18 mm.

MALE GENITALIA: Uncus tapering basally, posterior one-third with parallel sides, apex curved ventrally, terminating in single spine; socius represented by about six or eight setae; gnathos swollen medially, terminating in two large lateral lobes separated by small median ridge, their posterior surfaces finely spinose; each valve with small costal swelling; valvula with weak spine patch on outer side of lower portion of long row of elongate setae; processes of valves asymmetrical but of approximately same length, extending to base of uncus, with terminal setae on left process extending slightly farther posteriad than those on right side; right process flat, curved at edges, constricted near middle, terminal one-third tapering, curved posteriorly, with row of elongate spines from inner margin; left process similar to right one basally, with median constriction more basad, terminally

extending as tapering, pointed process, with several rows of posteriorly directed setae on outer margin; anellus sharply constricted medially from rounded base, enlarged posteriorly to form T-shaped process; tegumen with parallel sides, saccus elongate, bluntly pointed anteriorly; aedeagus subequal in length to combined lengths of uncus, tegumen, and saccus, with slender, tapering, sclerotized projection posteriorly, an elongate, slender, anterior portion, and with several longitudinal, slightly counterclockwise striations on dorsal surface; vesica unarmed. Abdomen with both sets of tufts on A_3 present, outer ones shorter than inner and arising from basal sack-like protuberance; posterior double comb consisting of about 10 or 12 modified, well-spaced setae medially on each side, laterally with numerous setae very closely spaced.

FEMALE GENITALIA: Sterigma with large, rather weakly sclerotized genital plate, slender anterior to round sinus vaginalis, extending well posteriad thereto; lamella antevaginalis very large, approximately two-thirds of length of apophyses anteriores, broad, of even width, slightly tapered distally, indented posteriorly, varying from shallow notch to rather prominent, U-shaped invagination; lamella postvaginalis very large, elongate, extending beyond lamella antevaginalis, tapering from wide base, apex bifurcate; ductus bursae continued anteriorly from lamella antevaginalis, tapering, becoming membranous and leaving well-sclerotized area dorsally before bluntly rounded end, joining corpus bursae ventrally; corpus bursae elongate, tending to have anterior end slightly swollen and curved, lightly sclerotized and rugose anterior to ductus bursae; signum very small.

EARLY STAGES: Unknown.

FOOD PLANT: Unknown.

TYPES: Holotype, male, El Volcan, Chiriqui, Panama, February 17, 1936 (Lutz and Gertsch); allotype, female, same data, February 16, 1936. Paratypes: *Panama*: Boquete, Chiriqui, elevation 3000 feet, three males. *Ecuador*: Paramba, [Imbabura], one male. *Costa Rica*: Orosi, elevation 1200 meters (Fassl), one male, five females; Casajal, January, 1924 (Janson), one male; Juan Vinas, May (Schaus and Barnes), one male;

Mt. Poas, May, one female. The holotype and allotype are in the collection of the American Museum of Natural History; paratypes are in the collections of the British Museum (Natural History) and of the United States National Museum.

RANGE: Costa Rica, Panama (the province of Chiriqui), and northern Ecuador (the province of Imbabura). The species apparently flies at moderate altitudes, as the elevations range from about 2500 to 4000 feet. The only dates of capture available are January, February, and May.

REMARKS: Fifteen specimens and 10 genitalic dissections were studied. The females seem to be somewhat more variable in color and maculation than the males, as there is a difference in the heaviness of the dark brown suffusion on the upper surface of the wings. One or two specimens are quite dark, with obliterated maculation, while the others are lighter and have a more clearly defined pattern. The females are similar to the females of *flexilinea fragosa*, while the males of the two species are more easily separated. In the present species the t. p. line tends to be straighter, and the wings are lighter in color than those of *flexilinea*.

The male genitalia are recognizable by the fact that the processes of the valves are of about equal length but are of different shapes and have different ornamentation.

The female genitalia of *fimbriata* are very similar to those of *imperfectaria*. In the present species the lamella postvaginalis is larger and wider at the base, and the ductus bursae is more heavily sclerotized and prominent.

***Melanolophia parma*, new species**

Plate 5, figure 17; text figures 43, 129

This is a small species having buff-colored wings with prominent maculation. In many specimens the t. p. line is broadly geminate, with the inner line the more prominent and outwardly dentate on the veins. The species occurs from Mexico through Panama.

MALE: Head, vertex yellowish buff; front pale buff dorsally, brownish gray ventrally; palpi pale buff at base, becoming grayish brown laterally. Thorax pale buff above, collar pale grayish brown, patagia yellowish buff, becoming pale grayish brown terminally; below pale buff, legs pale buff, pro-

thoracic and mesothoracic legs pale grayish brown on outer portions. Abdomen pale buff above, with scattered grayish brown scales, paler terminally and below.

UPPER SURFACE OF WINGS: Forewings with ground color pale buff or pale yellowish buff, spotted with groups of brown or grayish brown scales; cross lines broad, prominent, brown or grayish brown; t. a. line inwardly dentate on veins; median line usually complete, in some specimens slightly broken, rarely touching t. a. line; discal spot brown or grayish brown, separate or partially included in cross lines; t. p. line geminate, inner portion complete, broad, outwardly dentate on veins, sharply concave in cells in many specimens, outer portion varying from being complete and slightly narrower to being partially obsolescent; subterminal area of ground color, very sparsely dotted with brown spots; s. t. line consisting of more or less clearly defined cellular spots, in some specimens lost in dark shading of terminal area, with large spot in cell M_1 and above tornus; terminal line of blackish brown intravascular spots; fringe of ground color. Hind wings concolorous with forewings; median shade line narrow; discal spot very small or absent; extradiscal line narrow, obsolescent in anterior part of wing, geminate in lower portion in some specimens; s. t. line of prominent, more or less connected spots; terminal line of narrow, grayish black spots; fringe of ground color.

UNDER SURFACE OF WINGS: Unicolorous pale buff, broadly spotted with dull gray or grayish brown, and with spots on hind wings smaller; discal spots small or absent; maculation reflected from upper side, tending to be rather nebulous.

LENGTH OF FOREWING: 14 to 16 mm.; holotype, 14 mm.

FEMALE: Similar to male, tending to have slightly less dark spotting on upper and under surfaces of wings.

LENGTH OF FOREWING: 13 to 17 mm.; allotype, 16 mm.

MALE GENITALIA: Uncus tapering, laterally compressed; socius absent; gnathos broadly enlarged medially, as wide as base of uncus, slightly tapered distally, with median indentation; each valve with elongate costal tubercle and tuft of setae; valvula with

elongate spinose area; processes of valves slightly asymmetrical, one on left side slightly longer than that on right; right process shallowly S-shaped, broadened dorsally at base, edge of valve attached near middle of process, terminating in several recurved spines, extending to, or almost to, posterior portion of tegumen; left process similar to right one, less curved, slightly thinner, and having more terminal setae; anellus constricted medially, enlarged posteriorly, lateral edges tapering, posterior margin concave; tegumen with parallel sides, saccus U-shaped; aedeagus equal to, or slightly longer than, combined lengths of uncus, tegumen, and saccus, weakly C-shaped, with sclerotized, elongate, tapering projection posteriorly, and slender anterior end; vesica with small, weakly sclerotized plate. Abdomen with both sets of tufts on A_3 present, inner consisting of two parts, outer shorter and heavier, arising from basal sack-like protuberance; posterior double comb consisting of about 11 or 12 modified, well-spaced setae medially on each side, laterally with numerous setae very closely spaced.

FEMALE GENITALIA: Sterigma with prominent, circular, genital plate, rather weakly sclerotized, with sinus vaginalis slightly anterior to center; lamella antevaginalis elongate, heavily sclerotized, posteriorly curving, slightly tapering, apically truncate, in length slightly more than one-half of length of apophyses anteriores; lamella postvaginalis elongate, lightly sclerotized, slender, apex bifurcate, in length slightly longer than lamella antevaginalis; ductus bursae moderately long, somewhat pear-shaped; signum absent.

EARLY STAGES: Unknown.

FOOD PLANT: Unknown.

TYPES: Holotype, male, Tuis, Costa Rica, June, 1907, elevation 2400 feet; allotype, female, San José, Costa Rica, January, 1907, elevation 4000 feet. Paratypes: *Costa Rica*: Same data as holotype, one female; Juan Vinas, January, February, June (Schaus and Barnes), five males, five females; San José, October, November, 1906, elevation 4000 feet, two males, one female; Cartago, December, 1906, three females; Guapiles, June, one female; Tres Rios, December, 1906, elevation 5000 feet, one female; no further data, one male, five females. *Mexico*: Cordoba,

[Veracruz], 1908 (Fredk. Knab), one female. *Panama*: Chiriqui, one female; Lino, [Chiriqui], elevation 800 meters (Fassl), two females; El Volcan, Chiriqui, February 17, 1936 (Lutz and Gertsch), one female. No data, one male. The holotype and allotype are in the collection of the United States National Museum; paratypes are in the collections of that institution and of the American Museum of Natural History.

RANGE: Panama (the province of Chiriqui), Costa Rica, and Mexico (the state of Veracruz). This species apparently flies in the mountains at moderate altitudes, ranging from about 2400 to 5000 feet. It has been captured in January, February, June, November, and December.

REMARKS: Thirty-three specimens and six genitalic dissections were studied. This species is not only the smallest in this group but it is one of the smallest in the genus. Its very light-colored wings, with the heavy and contrasting maculation, are also unique for the species of group V.

The female genitalia are typical for this section of the genus. The large, curved lamella antevaginalis and the extending of the lamella postvaginalis well posteriad of the former are distinctive. In the male genitalia, the very large gnathos and the slightly asymmetrical process of the valves are characteristic.

GROUP VI

Two species are very similar in appearance to some in group I, while two others are grayish brown, with three straight cross lines. The upper surfaces of all the others are usually ochraceous brown or pale grayish brown. The cross lines vary from being weak to being moderately well represented; in some cases the t. a. line is shaded basally, and the t. p. line distally, with dark scales. Most of the species have the apex of the forewings pale grayish white and a large dark area posterior thereto. The light apical patch is usually represented on the under side, and a subterminal band is present in some species. There is a great similarity in the upper surface of the species in this group, and the genitalic structures offer the best means of identification. The moths of this group are usually large, with the length of the forewing ranging from 18 to 25 mm. and the average

size of the species, from 19.0 to 23.5 mm.

The male genitalia present marked differences among the various species. The uncus may be slender or broad, with a pointed apex, or it may be variously swollen, capitate, or bilobed. The gnathos may be rectangular, tapered, with a central lobe, or variously bifurcate. The anellus varies from being strap-like to being strongly constricted medially. The processes of the valves are of approximately equal length in four species. Five species have the left process longer, while in 10 species the reverse is true. The lateral hair pencils of the third abdominal segment are fused together terminally in seven species, while the paired posterior double comb is absent in two. The males of two species are not known.

In the female genitalia, the lamella postvaginalis is nearly always well developed, usually as an elongate, slender process. The lamella antevaginalis is more or less strongly developed in many of the species, while in others it is lacking. Four of the species have a membranous, funnel-like sterigma, while all the others have a large, symmetrical, elliptical sterigma. The female genitalia of six species are not known.

The early stages and food plants are not known for any of the species.

Group VI contains 21 species, and nearly every one is found in the Andes Mountains from Colombia to Bolivia. The only exceptions are two in Central America, Jamaica, and the Guianas, another one in French Guiana, one in the upper Amazon River drainage area, and one that extends from Central America to the Andes and southern Brazil.

Melanolophia orthotis Prout

Plate 5, figure 18; text figures 44, 130

Melanolophia orthotis PROUT, 1933, p. 93.

The color and maculation of this species indicate a relationship to some of the species of group I; however, the genitalia and the fused outer hair pencils of A_3 place it in this group. The species occurs in the upper Amazon River drainage area.

MALE: Head, vertex with mixed grayish white or pale buff and brown scales, the latter concentrated between bases of antennae;

front pale buff, dark brown across top and laterally by eyes below; palpi pale buff, laterally with brown or grayish brown scaling. Thorax above and patagia grayish white, latter with weak indication of median transverse bar; collar pale buff, with scattered brown scales; below grayish white; legs grayish white, variably spotted with dark gray or grayish brown. Abdomen grayish white or pale buff above, with scattered brown scales, those on A_3 tending to form paired dorsal spots; paler below.

UPPER SURFACE OF WINGS: Forewings with ground color pale buff or grayish white, evenly overlain with buff and dark brown scales; cross lines brown or dark brown, varying from being obsolescent to being clearly defined; t. a. line moderate to weak, strongly angled or curved into cell, with small basal bends on cubital and anal veins; median line straight, weakly represented in most specimens; discal spot blackish brown, small to moderate in size; t. p. line complete, subparalleling outer margin, straight or slightly curved, weakly outwardly dentate on veins in some specimens, with distal brownish black shading on both sides of anal vein; s. t. line clearly represented in upper part of wing, strongest opposite cell, becoming obsolescent posteriorly; terminal area variably shaded with grayish black or blackish brown opposite cell; terminal line of small, dull black, intravenular spots; fringe concolorous with wing. Hind wings concolorous with forewings; median line weak, broadly but weakly shaded distally in some specimens; discal spot small; extradiscal line prominent, straight or slightly curved, geminate, with outer line broadened in some examples; s. t. line weakly represented; terminal line and fringe like those on forewings.

UNDER SURFACE OF WINGS: Forewings pale buff or grayish white, overlain with scattered brown scales except along paler inner margin; hind wings concolorous with forewings; discal spots blackish brown, small; all wings with dark subterminal band, becoming weaker on secondaries; other cross lines absent or weakly represented.

LENGTH OF FOREWING: 16 to 21 mm.

FEMALE: Similar to male, but with upper surface of wings tending to be slightly more heavily overlain with buff and brown scales, with dark markings distal to t. p. line above

inner margin and in terminal area darker and more prominent. Under surface more heavily overlain with dark brown scales, and with discal spots and subterminal band tending to be more prominent.

LENGTH OF FOREWING: 20 to 21 mm.

MALE GENITALIA: Uncus tapering from wide base, curving ventrally and laterally compressed, elongate, terminating in single, long, spine-like point; socius represented by about three to five setae; gnathos tapering medially, extended ventrally into thick, subrectangular projection, apically on each side with rugose surface; each valve with small costal swelling; valvula with raised spine patch at foot of raised row of heavy setae; processes of valves asymmetrical, one on left side longer than that on right; right process narrow, gradually increasing in width posteriorly, apical one-fifth a capitate, more heavily sclerotized swelling, almost twice diameter of basal portion, with small protuberance on posterodistal section, and having narrow band of inwardly directed, dorsal setae arising from posterior edge, the process extending to posterior section of anellus; left process extending to middle of uncus, slender, basal two-fifths slender, flattened, apical three-fifths more heavily sclerotized, thicker, rounder, dorsal surface of apical portion with numerous heavy setae, terminally more elongate, extending beyond pointed apex of process on inner side; anellus membranous anteriorly, widened posteriorly into T-shaped, weakly sclerotized portion, posterior to this with sclerotized, transverse, transtilla-like process; tegumen widest posteriorly, saccus narrowed anteriorly; aedeagus slightly longer than combined lengths of tegumen and saccus, with slender, elongate, sclerotized projection posteriorly, and with several longitudinal striations on dorsal surface; vesica unarmed. Abdomen with both sets of tufts on A_3 present, outer ones fused together, forming prominent, apically curved protuberance; posterior double comb consisting of 12 to 15 modified, well-spaced setae medially on each side, laterally with numerous closely spaced setae.

FEMALE GENITALIA: Sterigma with prominent, raised ring around ostium bursae and with lightly sclerotized ovate area dorsally; lamella antevaginalis very large, sclerotized, in form of two slightly asymmetrical, raised

projections extending from posterior margin of sterigma ring to anterior portion of ostium bursae; lamella postvaginalis an elongate, lightly sclerotized, digitate projection arising between posterior margins of lamella antevaginalis, with apex bifurcate; ductus bursae elongate, rugose, slightly widened near corpus bursae, joining latter dorsally; corpus bursae large, slightly enlarged anteriorly; signum small.

TYPE: Holotype, male, in the collection of the British Museum (Natural History).

TYPE LOCALITY: Burity, 30 miles northeast of Cuyabá, Mato Grosso, Brazil. On the Hispanic America map SD21 of the American Geographical Society this is given as Fazenda Burity.

RANGE: Brazil (the state of Mato Grosso), Bolivia (the department of Cochabamba), Peru (the department of Puno), and Colombia (the department of Boyaca). This species occurs in the drainage basin of several of the tributaries of the upper Amazon River, mainly in the Tropical Wet and the Tropical Wet and Dry Zones. The adults have been taken at elevations of from about 1300 to 2800 feet in the months of April through November. (See Appendix for locality data of specimens examined.)

REMARKS: Twenty-two specimens and 12 genitalic dissections were studied. Although similar in maculation to some of the species of group I, the genitalia are more highly evolved, which indicates placement in the present group. The elongate, laterally flattened uncus and the characteristic processes of the valves, plus the fused lateral hair pencils of A_3 , are diagnostic characters for the male. In the female genitalia, the ring-like sterigma and the very large, paired lamella antevaginalis are of specific value.

***Melanolophia divergens* (W. Warren),**
new combination

Plate 6, figure 1; text figure 45

Cymatophora divergens W. WARREN, 1906, p. 506.

This species is very similar to *orthotis* in size, color, and maculation. The male genitalia offer good characters by which to separate the two species. *Melanolophia divergens* is known from French Guiana.

MALE: Head, thorax, and abdomen similar to those of *orthotis*.

UPPER SURFACE OF WINGS: Forewings with ground color pale buff, evenly overlain with buff and dark brown scales, with subterminal and terminal areas tending to be slightly darker than basal part of wing; cross lines brown, as in *orthotis*; t. p. line with distal brownish black shading on both sides of anal vein; terminal area shaded with brownish black opposite cell; terminal line of black intravenular spots. Hind wings concolorous with forewings, with band of ground color basal to extradiscal line; maculation like that in *orthotis*, but with stronger terminal line.

UNDER SURFACE OF WINGS: Similar to that of *orthotis*, with subterminal band tending to be more strongly represented on forewings.

LENGTH OF FOREWING: 19 to 20 mm.

FEMALE: Unknown.

MALE GENITALIA: Similar to those of *orthotis*, differing mainly in the processes of the valves, which are symmetrical, extending shortly beyond posterior margin of anellus, and shaped like right process of *orthotis*; posterior double comb consisting of 10 or 11 modified, well-spaced setae medially on each side, laterally with numerous closely spaced setae.

FEMALE GENITALIA: Unknown.

TYPE: The unique male type of *divergens* is U.S.N.M. No. 9357.

TYPE LOCALITY: St. Laurent, French Guiana.

RANGE: French Guiana. This species is known only from the type locality, a town about 20 miles from the Atlantic Ocean up the Maroni River. The single dated specimen is labeled November. (See Appendix for locality data of specimens examined.)

REMARKS: Two specimens and two genitalic dissections were studied. While *divergens* is almost identical in size, color, and pattern to *orthotis*, it can be distinguished by the symmetrical processes of the valves.

***Melanolophia intervallata* (W. Warren),**
new combination

Plate 6, figure 2; text figures 46, 131

Nipteria intervallata W. WARREN, 1900, p. 189.

Tephrosia intervallata SCHAUS, 1915, p. 501.

Cymatophora flaviceps W. WARREN, 1907, p. 274. New synonymy.

Melanolophia directilinea SCHAUS, 1911, p. 600; 1915, p. 501 (synonymy).

This species and the following are two closely allied taxa that appear out of place in this group, based on color and maculation. In appearance, *intervallata* closely resembles *seriata*, *limosa*, and *tenebrosa* of group III, but can be recognized by the yellowish orange-colored head and prothorax. The genitalia are quite distinctive, and the outer hair pencil on A_3 is fused. On the basis of these structures the species is placed in this group. This species occurs from Costa Rica and Panama to Brazil, Peru, and Ecuador.

MALE: Head, vertex and front pale yellowish orange, slightly darkened at top of front; palpi pale brownish gray, with yellowish orange scales basally. Thorax and patagia creamy or pale buff above; collar pale brownish gray; beneath pale yellowish orange anteriorly, becoming pale buff posteriorly; legs pale buff, variably shaded with grayish brown. Abdomen pale buff or brownish gray above; paler below.

UPPER SURFACE OF WINGS: Forewings with ground color pale brownish gray or grayish brown, lightly overlain with light brown scales; cross lines narrow, more or less straight, brown or ochraceous brown; t. a. line curving into cell, sharply angled and then straight to inner margin; median line straight, passing about 1 mm. basad of dark discal spot, rarely confluent with spot; t. p. line straight or with slight bend anteriorly; s. t. line incomplete, with brown or brownish black spots in cells M_1 and M_2 , and with traces of other spots in some specimens; terminal line of small dark dots, more strongly represented anteriorly or in form of thin line in some specimens; fringe concolorous with wing. Hind wings concolorous with forewings, with area basal to extradiscal line tending to be slightly paler than outer part of wing; median line straight, shaded distally in some specimens by faint area of brownish gray; discal spot small or obsolescent; extradiscal line straight or gently curved, prominent; s. t. line varying from being absent to being mostly complete; terminal line and fringe like those on primaries.

UNDER SURFACE OF WINGS: Forewings pale grayish brown, lightly sprinkled with light brown scales except along paler inner margin; hind wings concolorous with, or slightly paler

than, forewings; discal dots brown, small or obsolescent; most specimens without maculation except for subterminal band on upper part of forewings and for terminal line, rarely with indication of other cross lines.

LENGTH OF FOREWING: 19 to 22 mm.

FEMALE: Similar to male but with upper surface of wings tending to be more heavily overlain with dark scales, with cross lines slightly more clearly represented, and with t. p. line more irregular in course; under surface with strong subterminal band in most specimens.

LENGTH OF FOREWING: 19 to 22 mm.

MALE GENITALIA: Uncus tapering, terminal portion broadened, sharply curved ventrally, posterior surface with prominent keel; socius represented by about four to six setae; gnathos slender, slightly enlarged medially, very weakly bilobed, with short dorsal projection; each valve with prominent costal tubercle and tuft of elongate setae; valvula with spine patch absent, but with anterior part of raised, setose ridge swollen, with heavier setae; processes of valves asymmetrical, one on left side longer than that on right; right process flattened, within enveloping margin of valve except for more heavily sclerotized, pointed apex, with constriction about one-third of distance from base, process extending to base or middle of uncus; left process longer than valve, basal one-third within enveloping margin of valve, then swollen, occupying most of width of valve, with an elongate, curved, tapering, terminal process, with dorsal, posteriorly directed, heavy spines arising from apical region; anellus with rounded base, sharply tapering and narrowed medially, broadly swollen into large, subovate, posterior process; tegumen slightly widened medially, saccus broadly U-shaped; aedeagus slightly longer than combined lengths of tegumen and saccus, with small, sclerotized projection posteriorly, and with several weak, longitudinal striations on dorsal surface; vesica unarmed. Abdomen with both sets of tufts on A_3 present, outer ones fused together, forming prominent, apically curved protuberance; posterior double comb absent.

FEMALE GENITALIA: Sterigma membranous, sinus vaginalis near bottom of large de-

pression formed by sterigma and posterior margin of sternite; lamella antevaginalis not differentiated; lamella postvaginalis large, produced anterolaterally around sinus vaginalis, extending posteriorly as large, sclerotized projection, bilobed posteriorly, extending beyond posterior margin of sternite; ductus bursae short, membranous, becoming lightly sclerotized and rugose anteriorly and forming short, dorsal arm on elongate corpus bursae; signum small.

TYPES: The types of *intervallata* and *flaviceps* are in the collection of the British Museum (Natural History). The male specimen of *directilinea* from Juan Vinas, Costa Rica, with the genitalia on a slide labeled "U.S.N.M. 445 H.W.C. 6 December 1939," is hereby designated the lectotype.

TYPE LOCALITIES: Paramba, [Imbabura], Ecuador (*intervallata*); Pozuzu, Huánuco, Peru (*flaviceps*); Juan Vinas, Costa Rica (*directilinea*).

RANGE: Costa Rica, Panama (the province of Chiriqui), Ecuador (the province of Imbabura), Peru (the departments of Huánuco and Puno), and Brazil (the state of Santa Catarina). This very wide-ranging species has been taken at elevations of from about 1300 to 6000 feet, and in the months of February, March, August, and November. (See Appendix for locality data of specimens examined.)

REMARKS: Twelve specimens and nine genitalic dissections were studied. This species occurs in Central America, the Andes Mountains, and in the Humid Subtropical Zone of southern Brazil. With the very limited material at hand, it is not possible to say much about the geographic variation of this species.

In appearance, *intervallata* can be mistaken for a species of the *seriata-limosa-tenebrosa* complex of group III. The present species was probably developed from this group of moths, as some of the characters of the female, in both maculation and genitalia, indicate a relationship. The male genitalia and the fused outer hair pencils of A_3 are more highly evolved than are these structures in the species of group III; in fact, they fit in with the species of group VI. Both this and the following species lack the posterior

double comb of the male abdomen. The type of female genitalia that is found in *mutabilis* and its close relatives shows a close similarity to those structures in *intervallata*.

***Melanolophia pseudovallata*, new species**

Plate 6, figure 3; text figure 47

Cymatophora flaviceps W. WARREN, 1907, p. 274 (*partim*).

This species is virtually identical with *intervallata*, but the male genitalia are different in the two species. The female of the present species is unknown. *Melanolophia pseudovallata* occurs in Bolivia.

MALE: Head, thorax, and abdomen like those of *intervallata*.

UPPER SURFACE OF WINGS: Forewings with ground color pale grayish brown, lightly overlain with light brown scales; cross lines narrow, more or less straight, brown, as in *intervallata* but tending to be slightly more strongly represented; discal spot blackish brown, situated adjacent to or up to 1 mm. from median line; terminal area darker than remainder of wing in some specimens. Hind wings concolorous with forewings, as in *intervallata* but with discal dot and cross lines more strongly represented.

UNDER SURFACE OF WINGS: Similar to that of *intervallata* but with cross lines tending to be weakly represented.

LENGTH OF FOREWING: 20 to 22 mm.; holotype, 20 mm.

FEMALE: Unknown.

MALE GENITALIA: Similar to those of *intervallata*, differing mainly in the processes of the valves: process of right valve mostly within enveloping margin of valve except for short, bluntly pointed, more heavily sclerotized apical region, of even width, distal margin with one or two small indentations, apical region with single curving row of heavy setae dorsally, the process extending to posterior margin of tegumen; left process not attaining apex of valve, outer one-half in form of tapering arm with band of heavy setae arising distally and curving dorsally along entire length.

FEMALE GENITALIA: Unknown.

TYPES: Holotype, male, Chapare, [Cochabamba], Bolivia, August 28, 1949 (Peña). Paratypes, all from Bolivia: Same data as

type, August 27, 29, December 8, 1949 (Peña), three males; Charaplaya, [Cochabamba], June, 1901, elevation 1300 meters (Simons), one male. The holotype is in the collection of the American Museum of Natural History; paratypes are in the collections of that institution and of the British Museum (Natural History).

RANGE: Bolivia (the department of Cochabamba). This species occurs on the eastern slope of the Andes Mountains at moderate (4200 feet) elevations. The adults have been captured in June, August, and December.

REMARKS: Five specimens and three genitalic dissections were studied. This species is very closely allied to *intervallata*. The specimens from Chapare are of a grayer color than is the Charaplaya specimen; the latter is almost 50 years older, which may be the reason for the apparent difference.

The male genitalia of *pseudovallata* have shorter processes of the valves than those of *intervallata*, and both processes have more spines than in the latter species.

***Melanolophia reducta* (W. Warren),
new combination**

Cymatophora reducta W. WARREN, 1904, p. 553.

This is a medium to large-sized moth that is mainly brown in color. The cross lines are distinct, and most specimens have a large pale area at the apex of the forewing. The females have the outer portion of the wings much darker than do the males. As this species closely resembles several of the following, it is advisable to use the genitalia for identification. This and the next five species have a narrow, tapering uncus. *Melanolophia reducta* occurs in three subspecific populations in the Andes Mountains; there is a smaller, somewhat mottled subspecies in Ecuador and north and central Peru, and larger, paler subspecies in both southern Peru and Bolivia, and Colombia.

***Melanolophia reducta reducta* (W. Warren)**

Plate 6, figure 4

Cymatophora reducta W. WARREN, 1904, p. 553.

This is a relatively small, mottled subspecies, with the wings tending to be medium or dark brown in color.

MALE: Head, vertex with mixed buff and brown scales; front buff or pale buff, with

brown or dark brown scales across top and on each side by eye; palpi brown, with pale buff scales basally. Thorax buff or pale buff above, collar grayish buff, becoming dull grayish black apically, patagia concolorous with thorax or slightly darker, with narrow, transverse, black band medially; below buff or pale buff; legs pale buff, variably spotted with brown and dark brown. Abdomen grayish brown above, with scattered brown scales, pale buff basally and posteriorly; below paler.

UPPER SURFACE OF WINGS: Forewings with ground color pale buff or ochraceous buff, more or less heavily overlain with brown, dark brown and ochraceous brown scales; cross lines brown or ochraceous brown, prominent to partially obsolescent, with t. a. and t. p. lines sinuate; t. a. line complete, with strong outward bows in cells, geminate in many specimens, with inner line weaker than outer, narrowly filled with reddish ochraceous scales; median line varying from being complete to being obsolescent, in many specimens represented by strong costal spot and tending to be outwardly dentate; discal spot black, prominent; t. p. line tending to be geminate in upper and lower parts of wing, swinging outwardly between veins M_3 and Cu_2 and becoming fainter, upper and lower parts shaded outwardly by dark brown scales in many specimens, concave between veins, strongly so in cells M_1 , M_2 , and Cu_2 ; subterminal area tending to be slightly darkened in upper part of wing; s. t. line complete, heaviest below costa, with spots tending to be contiguous; terminal area with apex broadly pale gray or grayish buff to vein M_1 , with cells M_1 and M_2 heavily shaded with dark brown scales; terminal line of blackish brown intravenular spots; fringe concolorous with wing basally, becoming paler distally. Hind wings concolorous with forewings; median line weakly represented; discal spot blackish gray, small; extradiscal line more or less straight, weak in anterior part of wing, becoming geminate and heavily shaded posteriorly; terminal and subterminal areas darker than basal and median areas; s. t. line complete, of small spots; terminal line and fringe like those on forewings.

UNDER SURFACE OF WINGS: Unicolorous pale gray or pale grayish brown, heavily spotted with brown or brownish gray scales

except at paler apex and along inner margin of forewings; hind wings slightly paler than forewings; discal spots and maculation weakly reflected from upper surface.

LENGTH OF FOREWING: 19 to 23 mm.

FEMALE: Unknown.

MALE GENITALIA: Uncus tapering from broad base, apical portion of even width, curving ventrally, terminating in single point; socius represented by about six to eight setae; gnathos slender, enlarged medially, with two lateral, widely separated, rugose swellings, area between flat and with small, posterodorsal projection; each valve with prominent costal tubercle and tuft of elongate setae; valvula without spine patch; processes of valves asymmetrical, one on left side approximately twice as long as that on right; right process slender, gently curved, slightly enlarged distally, pointed apically, with single spine on outer surface near distal end, the process extending to or slightly beyond posterior portion of anellus; left process extending to base or middle of uncus, with basal portion as on right side, posteriorly a free, straight arm, ventrally with narrow band of setae, curving outwardly near apex and terminating in thick, inwardly curved, dorsal spine under bluntly pointed apex; anellus with subrectangular base, sharply narrowed medially, extended posteriorly on each side as narrow arm, forming Y-shaped process; tegumen widest posteriorly, saccus bluntly pointed anteriorly; aedeagus slightly shorter than combined lengths of uncus, tegumen, and saccus, with very slender, tapering, sclerotized projection posteriorly, and with a few longitudinal striations on dorsal surface; vesica unarmed. Abdomen with both sets of tufts present on A₃, outer ones shorter and heavier than inner and arising from basal sack-like protuberance; posterior double comb consisting of about nine to 11 modified, well-spaced setae medially on each side, laterally with numerous setae very closely spaced.

FEMALE GENITALIA: Unknown.

TYPE: In the British Museum (Natural History).

TYPE LOCALITY: Cerro de Pasco, Huanca-bamba, Peru, elevation 6000 to 10,000 feet.

RANGE: Southern Ecuador (the province of Loja) and northern and central Peru (the

departments of Piura, Junin, and Pasco). This is a species of the higher mountains, as examples have been taken from 3000 to 10,000 feet. The dates of capture are "June-August" and October. (See Appendix for locality data of specimens examined.)

REMARKS: Fifty-seven specimens and 11 genitalic dissections were studied. This population is fairly homogeneous in size, color, and maculation, although some individual variability is to be found.

The male genitalia of the Peruvian specimens show slight variation in the length of the process of the left valve, as it usually extends to about the middle of the uncus. There is also some variability in the strength of the spine on the right process, although it is usually rather small and relatively inconspicuous. In the two specimens from Ecuador, both labeled "Environs de Loja," the process of the left valve is shorter than that of typical Peruvian examples, as it reaches the end of the tegumen, and the spine on the right process is heavier and more conspicuous. Owing to lack of adequate material, it cannot be stated whether or not this variation is constant, so these Ecuadorian specimens are included with the typical subspecies from Peru.

Melanolophia reducta meridiana, new subspecies

Plate 6, figure 5; text figures 48, 132

In southern Peru and Bolivia *reducta* is represented by a larger, paler, and less mottled population.

MALE: Head, thorax, and abdomen like those of nominate subspecies, some specimens with slightly more brown scaling.

UPPER SURFACE OF WINGS: Forewings with ground color pale buff or pale ochraceous buff, with a few scattered brown, dark brown, and ochraceous brown scales; cross lines like those in nominate subspecies, but with t. a. and t. p. lines tending to be slightly less sinuate, and s. t. line usually becoming obsolescent in lower part of wing. Hind wings similar to forewings.

UNDER SURFACE OF WINGS: Slightly paler than those of nominate subspecies.

LENGTH OF FOREWING: 20 to 24 mm.; holotype, 22 mm.

FEMALE: Similar to male, but with upper surface of wings more heavily overlain with

orange-brown scales, and with subterminal and terminal areas dark brown and orange-brown, contrasting with basal part of wing; fringe of ground color. Under surface similar to upper, with outer portion of wings dark brown.

LENGTH OF FOREWING: 20 to 23 mm.; allotype, 23 mm.

MALE GENITALIA: Similar to, but larger than, those of nominate subspecies, with process of left valve tending to be slightly shorter and with terminal spine slightly heavier, and with process of right valve slightly shorter and more capitate.

FEMALE GENITALIA: Sterigma with prominent, more or less elliptical, genital plate, heavily sclerotized and raised around sinus vaginalis, extending posteriad thereof as more membranous area; lamella antevaginalis a flat or curved plate over anterior portion of sinus vaginalis; lamella postvaginalis elongate, approximately one-half to two-thirds of length of apophyses anteriores, broad, of equal width throughout or with constriction before apex, the latter rounded, shallowly to moderately bifurcate; ductus bursae situated medially, lightly sclerotized, constricted anteriorly before dorsal junction with corpus bursae; corpus bursae moderately long, slightly enlarged anteriorly; signum very small.

TYPES: Holotype, male, and allotype, female, Oconeque, Carabaya, [Puno], Peru, July, 1904 (dry season), elevation 7000 feet (G. Ockenden). Paratypes: *Peru*: Same data as types, July, 1904, February, 1905, 10 males, two females; Agualani, Carabaya, [Puno], December, 1905 (wet season), elevation 4000 feet, one male; Santo Domingo, Carabaya, [Puno], January, March, May, June, October, November, December, 1901–1904, elevation 6000–6500 feet (G. Ockenden), 22 males, three females; Callanga, Cuzco, February 16, 1950 (F. L. Woytkowski), one male; no further data, three males. *Bolivia*: Yunga del Espiritu Santo, Cochabamba, 1888–1889 (P. Germain), two males; La Paz (E. Garlepp), one male; no further data, two males. The holotype and allotype are in the collection of the British Museum (Natural History); paratypes are in the collections of that institution and of the American Museum of Natural History.

RANGE: Southern Peru (the departments of Cuzco and Puno) and Bolivia (the departments of La Paz and Cochabamba). This subspecies is apparently found in and around the high arid plateau country surrounding Lake Titicaca. It has been taken at elevations of from about 3000 to 7000 feet in both the wet (November through March) and dry (May, June, July, October) seasons.

REMARKS: Forty-nine specimens and 15 genitalic dissections were studied. This southern population is larger and paler than the typical one, with the differences in color, maculation, and genitalia that are described above.

***Melanolophia reducta borea*, new subspecies**

Plate 6, figure 6; text figure 49

The Colombian population (as far as is known) of *reducta* is also large, pale, and without mottling. The male genitalia offer good characters for identification.

MALE: Head, thorax, and abdomen like those in nominate subspecies.

UPPER SURFACE OF WINGS: Forewings with ground color pale buff, with scattered brown and dark brown scales, overlain with ochraceous scales along costa and in subterminal and terminal areas; cross lines like those in nominate subspecies, less strongly marked, with t. a. and t. p. lines apparently slightly less sinuate, with s. t. line obsolescent in lower part of wing. Hind wings similar to forewings.

UNDER SURFACE OF WINGS: Slightly paler than those of nominate subspecies.

LENGTH OF FOREWING: 23 mm. (holotype).

FEMALE: Unknown.

MALE GENITALIA: Similar to those of nominate subspecies, but with process of left valve much shorter, extending only as far as transtilla and having a single, heavy terminal spine, process of right valve with single, heavy spine from outer surface near apex.

FEMALE GENITALIA: Unknown.

TYPE: Holotype, male, Cañon del Tolima, [Tolima], Colombia, December, 1909, elevation 2700 meters (A. H. Fassl). The type is in the collection of the British Museum (Natural History).

RANGE: Colombia, known only from the single type specimen.

REMARKS: One specimen and one genitalic

dissection were studied. The moth is very similar in appearance to *reducta meridiana*, although it is perhaps slightly paler, owing partly to the fact that the forewings are slightly rubbed.

Genitally this specimen is the most distinctive of any of the *reducta* populations studied, with the short process of the left valve, and with the processes of both valves having a single, heavy terminal spine.

***Melanolophia corza* (Dognin), new combination**

Plate 6, figure 7; text figures 50, 133

Tephrosia corza DOGNIN, 1895, p. 115.

The males of this species are unknown. The females are quite similar to the females of *reducta meridiana*. The cross lines, particularly the t. p. line, are more smoothly and evenly curved, the outer portion of the forewings is more of an orange-brown color, and the secondaries are a darker brown than are these features in the preceding species. *Melanolophia corza* is known from Ecuador and Bolivia.

MALE: Unknown.

FEMALE: Head, thorax, and abdomen like those of *reducta meridiana*.

UPPER SURFACE OF WINGS: Forewings with ground color pale buff, more or less heavily overlain with ochraceous and brown scales; pattern like that of *reducta meridiana*, but with t. a. line less sharply curved, and with t. p. line more gently and evenly curved; subterminal and terminal areas orange-brown, the latter overlain with dark brown scales; fringe concolorous with wing, of ground color at vein endings. Hind wings concolorous with forewings, heavily and evenly overlain with dark grayish brown scales; outer portion of wing dark grayish brown, with contrasting fringe of ground color.

UNDER SURFACE OF WINGS: Unicolorous pale buff, very heavily overlain with dark grayish brown or dark brown scales except at apex and along inner margin; hind wings with slightly less overlay of dark brown scales; discal spots and maculation reflected from upper surface, subterminal and terminal areas on all wings broadly blackish brown; fringe of ground color on secondaries and lower portion of primaries.

LENGTH OF FOREWING: 22 to 24 mm.

MALE GENITALIA: Uncus tapering, apical portion of even width, curving ventrally, terminating in single point; socius represented by about eight setae; gnathos very broad medially, as wide as base of uncus; swollen laterally, slightly concave and rugose medially; each valve with prominent costal tubercle and tuft of elongate setae; valvula without spine patch; processes of valves asymmetrical, one on right side approximately twice as long as that on left; right process arising from broad base, slender, slightly swollen apically, with band of short setae on outer surface of distal one-half of process, curving around apex, dorsally with single, very heavy, elongate, posteromedially directed spine, the process extending to posterior margin of tegumen; left process extending to near posterior portion of anellus, base similar to that of right process, with small, globular process posteriorly, having short setae distally and single, heavy spine dorsally; anellus with subrectangular base, section along mid-line raised and sharply constricted, broadly enlarged posteriorly, with rounded posterior margin; tegumen widest posteriorly, saccus bluntly rounded anteriorly; aedeagus slightly shorter than combined lengths of uncus, tegumen, and saccus, with slender, tapering, sclerotized projection posteriorly, and with a few longitudinal striations on dorsal surface; vesica unarmed.

FEMALE GENITALIA: Sterigma with prominent genital plate, oval, slightly wider posteriorly, appearing more heavily sclerotized lateral to sinus vaginalis owing to more vertical nature of sclerotized ridges; lamella antevaginalis flat, sclerotized, lip-like, extending diagonally across sinus vaginalis; lamella postvaginalis an elongate, sclerotized projection, wide at base, constricted medially, indented posteriorly on mid-line, in length about two-fifths of length of apophyses anteriores; ductus bursae short, membranous, becoming sclerotized and rugose anteriorly, joining corpus bursae ventrally; corpus bursae elongate, lightly sclerotized and rugose around ductus bursae; signum small.

TYPE: Dognin described *corza* from a single female (U.S.N.M. No. 32985).

TYPE LOCALITY: "Environs de Loja," [Loja], Ecuador.

RANGE: Southern Ecuador (the province of

Loja) and Bolivia (the department of Beni). The only known date of capture is September. (See Appendix for locality data of specimens examined.)

REMARKS: Two specimens and two genitalic dissections were studied. While the male is unknown, the genitalic structures of this sex were found attached to the genitalia of the type female when the latter were dissected.

The females of *corza* are slightly larger than those of the preceding species, and are more heavily suffused with dark scales above. The pattern of this species is represented by more gently curved lines than that in *reducta*, and the subterminal area of the forewings is more orange-brown.

While similar to the male genitalia of *reducta*, these structures in *corza* are easily distinguished by the fact that the process of the right valve is longer than the left; in *reducta* the opposite is true. The female genitalia of *corza* and *reducta* are similar, but the lamella postvaginalis of the present species is constricted medially, the lamella antevaginalis is situated diagonally, and the sterigma is more oval.

Melanolophia madefactaria (Dyar),
new combination

Plate 6, figure 8; text figure 134

Tephrosia madefactaria DYAR, 1914, p. 425.

The males of this species are unknown. The females are similar to those of *corza* but are much darker in color. The cross lines of the forewing are more angulate, and the subterminal and terminal areas are much broader than those of *corza*. This species is known only from Dominica.

MALE: Unknown.

FEMALE: Head, thorax, and abdomen like those of *corza* but more heavily suffused with dark grayish brown.

UPPER SURFACE OF WINGS: Forewings with ground color pale buff, heavily overlain with ochraceous brown, dark brown, and blackish brown scales; pattern like that of *corza*, with t. a. line sharply outwardly biangulate; median line broad; t. p. line bent inwardly into cell, with area between this and discal spot of ground color, the line produced basally again on anal vein, with blackish brown scales in concave area; subterminal and terminal areas very broad, almost oc-

cupying one-half of wing, dark brown and blackish brown, with latter tending to be concentrated in upper portion of wing; s. t. line an indistinct dark area, marked with white scales in many of the cells, most prominently in cell M_1 , and shaded distally to wing margin with ground color; terminal line of small, black, intravenular spots; fringe whitish buff anteriorly, becoming dark gray posteriorly. Hind wings concolorous with forewings, heavily and evenly overlain with dark grayish brown scales; median band broad, dark; outer portion of wing very broad, as on forewings, bordered basally by weakly curved extradiscal line; fringe like that on primaries.

UNDER SURFACE OF WINGS: Basal area unicolorous pale buff, heavily overlain with dark grayish brown and dark brown scales except at apex and along inner margin; outer portion of wings solidly brownish black, very broad, except for large, white, apical spot on primaries and smaller, more elongate, white spot at apex of secondaries; discal spots and maculation reflected from upper surface; fringe concolorous with wing.

LENGTH OF FOREWING: 19 mm.

MALE GENITALIA: Unknown.

FEMALE GENITALIA: Sterigma with prominent genital plate, appearing more heavily sclerotized anterior and lateral to sinus vaginalis owing to more vertical nature of sclerotized ridges, and produced laterally; lamella antevaginalis a small, rim-like lip around anterior and lateral margins of sinus vaginalis, enlarged anteromedially; lamella postvaginalis an elongate, slender, sclerotized projection, more lightly sclerotized at base, weakly constricted medially, indented posteriorly at mid-line, in length about two-thirds of length of apophyses anteriores; ductus bursae short, membranous, joining sclerotized and rugose arm of corpus bursae; corpus bursae elongate; signum small.

TYPE: Dyar described *madefactaria* from a single female (U.S.N.M. No. 18060).

TYPE LOCALITY: Dominica.

RANGE: Dominica. The unique type was caught in June-July. (See Appendix for locality data of specimen examined.)

REMARKS: One specimen and one genitalic dissection were studied. This species, while showing a close relationship to *corza*, is very distinct. The very wide and very dark outer

band of both the upper and under surfaces, plus the angulate nature of the cross lines of the forewing, will serve to distinguish it.

The female genitalia also show close relationships to those of *corza*. The much longer and more slender lamella postvaginalis will serve to distinguish *madefactaria*.

***Melanolophia reductaria*, new species**

Plate 6, figure 9; text figures 51, 135

This is a large moth, usually light brown or grayish brown, with distinct t. a. and t. p. lines in most specimens. The females have an orange-brown subterminal area. The species is very similar to *reducta*, and the genitalia offer the best means of identification. It occurs in Peru and Bolivia.

MALE: Head, thorax, and abdomen like those of *reducta*, but with collar tending to be more or less concolorous with thorax.

UPPER SURFACE OF WINGS: Forewings with ground color pale buff or pale grayish brown, lightly overlain with brown, dark brown, and ochraceous brown scales; cross lines very similar to those of *reducta*, dark brown, median line weak, t. a. and t. p. lines tending to be geminate and to be filled with ochraceous or orange-brown scales; discal spot black, prominent; t. p. line tending to be of even width throughout, slightly obsolescent in middle of wing in some specimens, shaded distally by dark brown scales opposite cell and above inner margin; subterminal and terminal areas slightly darker than median area; s. t. line strongly represented in upper part of wing, becoming obsolescent below; terminal area broadly pale gray or grayish buff to vein M_1 , cells M_1 and M_2 more or less shaded with brownish black scales; terminal line represented by blackish brown intra-venular spots, becoming small or obsolescent in lower part of wing; fringe concolorous with wing, darkened in cells R_5 , M_1 , and M_2 . Hind wings concolorous with forewings, as in *reducta*.

UNDER SURFACE OF WINGS: Unicolorous pale buff or pale grayish buff, more or less heavily overlain with brown or grayish brown scales except at apex and along inner margin, hind wings slightly paler, with coarser overlay; discal spots and maculation more or less reflected from upper surface, with broad sub-

terminal band on primaries in some specimens.

LENGTH OF FOREWING: 21 to 23 mm.; holotype, 21 mm.

FEMALE: Similar to male, but with upper surface of wings more heavily overlain with ochraceous and pale orange-brown scales, particularly in subterminal area of forewings. Under surface more heavily overlain with brown scales and with maculation tending to be more definitely represented.

LENGTH OF FOREWING: 20 to 24 mm.; allotype, 23 mm.

MALE GENITALIA: Uncus tapering from broad base, apical portion attenuate, apex curved ventrally, terminating in single point; socius represented by about five or six setae; gnathos slender, enlarged medially, rugose, concave between raised lateral margins and median ridge; each valve with prominent costal tubercle and tuft of elongate setae; valvula without spine patch; processes of valves asymmetrical, one on right side slightly longer than left one; right process with basal three-fifths curved and very slightly widened apically, then constricted, terminal portion straight, capitate, with numerous closely appressed setae on outer side, curving dorsally, terminating in single, very heavy spine directed inwardly under bluntly pointed tip of process, the latter extending almost to base of gnathos; left process extending to posterior portion of anellus, similar to right process but with terminal section shorter; anellus with subrectangular base, sharply narrowed medially, then splitting into two narrow, divergent arms; tegumen broadest posteriorly, saccus bluntly pointed anteriorly; aedeagus slightly shorter than combined lengths of uncus, tegumen, and saccus, with tapering, sclerotized projection posteriorly and with several longitudinal striations on dorsal surface; vesica unarmed. Abdomen with both sets of tufts on A_3 present, outer ones shorter and heavier than inner and arising from basal sack-like protuberance; posterior double comb consisting of about 10 modified, well-spaced setae medially on each side, laterally with numerous setae very closely spaced.

FEMALE GENITALIA: Sterigma with relatively small and lightly sclerotized genital plate, more heavily sclerotized anteriorly of

sinus vaginalis, extending posteriad thereof as larger, more membranous area; lamella antevaginalis well sclerotized, very large, extending outwardly to become about three or four times as wide as sinus vaginalis, then sharply narrowed, with two prominent, ridged, posteriorly directed projections; lamella postvaginalis elongate, approximately one-half of length of apophyses anteriores, broad, of equal width throughout, apex rounded, with small median indentation; ductus bursae situated medially or slightly to right of mid-line, small, lightly sclerotized, tapering, with dorsal connection to corpus bursae; corpus bursae moderately long, slightly enlarged anteriorly; signum very small.

TYPES: Holotype, male, and allotype, female, Agualani, Carabaya, [Puno], Peru, December, 1905 (wet season), elevation 9000 feet (G. R. Ockenden). **Paratypes:** *Peru:* Same data as types, June, August (dry season), December (wet season), 1905, five males; La Oroya, R. Inambari, October, 1904 (wet season), March, 1905 (wet season), elevation 3100 feet (G. Ockenden), two males; Oconeque, Carabaya, [Puno], July, 1904 (dry season), February, 1905, elevation 7000 feet (G. Ockenden), six females; Huadquina, [Cuzco], July 24, 1911, elevation 5000 feet (Yale Peruvian Expedition), one male; Tinguri, Carabaya, [Puno], one male; no further data, one male. *Bolivia:* Rio Songo, province of Yungas, February–May, 1896, one male; Rio Songo to Rio Suapi, [La Paz], March–June, elevation 1100 meters (Garlepp), one male; R. Tanampaya, 1894 (Garlepp), three males; Incachaca, Cochabamba (J. Steinbach), seven males, one female; Yungas del Palmar, February 10, 1948, elevation 2000 meters, one male. The holotype and allotype are in the collection of the British Museum (Natural History); paratypes are in the collections of that institution, of the American Museum of Natural History, and of the United States National Museum.

RANGE: Southern Peru (the departments of Cuzco and Puno) and Bolivia (the departments of La Paz and Cochabamba). This is also a species of the high Andean region, being captured from about 3100 to 9000 feet. It flies in both the wet (October, December, February, and March) and dry (June, July, and August) seasons.

REMARKS: Thirty-two specimens and 17

genitalic dissections were studied. This species is very similar to *reducta*, especially *reducta meridiana*, which occurs in the same area. The present species tends to have the cross lines slightly less sinuate than in *reducta*, and to have the t. p. line more strongly represented in the middle of the wing. The females of *reductaria* are less contrastingly marked than are the females of *reducta meridiana*.

The genitalia offer the best method of identifying this species. In the male genitalia, the process of the right valve is longer in *reductaria*, while the reverse is true in *reducta*. The very large lamella antevaginalis is characteristic of the female genitalia of this species.

***Melanolophia dextera*, new species**

Plate 6, figure 10; text figure 52

The upper surface of the wings is very similar to that of *reductaria*, but the ground color is slightly paler and grayer. The female is unknown. The genitalia should be studied to make certain of the identification. The species occurs in Colombia.

MALE: Head, thorax, and abdomen like those of *reductaria*.

UPPER SURFACE OF WINGS: Forewings with ground color pale grayish buff or pale grayish brown, overlain with ochraceous and brown scales; maculation and hind wings like those of *reductaria*.

UNDER SURFACE OF WINGS: Like that of *reductaria*, but with subterminal band tending to be slightly more strongly represented in some specimens.

LENGTH OF FOREWING: 23 to 24 mm.; holotype, 23 mm.

FEMALE: Unknown.

MALE GENITALIA: Uncus narrowed from broad base, sides concave, terminal portion elongate, tending to have parallel sides, apex slightly swollen, rounded, with small ventral rim or with two small, lateral points; socius represented by five or six setae; gnathos with median area rugose, swollen laterally, concave medially; each valve with prominent costal tubercle and tuft of elongate setae; valvula without spine patch; processes of valves asymmetrical, left process about two-thirds of length of right one; right process slender, elongate, basal portion slightly curved, widened medially, outer one-half with slightly more heavily sclerotized strip on outer side,

with band of short setae beginning on ventral surface, becoming longer and curving around outer margin to near bluntly pointed apex, with single, heavy, posteromedially directed dorsal spine, process extending to middle of uncus; left process extending beyond posterior margin of anellus, basal portion similar to right process but slightly shorter, apical section short, swollen, with bulge on outer side posteriorly, with band of setae situated on outer surface of bulge and with single heavy, medioposteriorly directed dorsal spine; anellus with small base, sharply narrowed medially, broadly expanded distally, with more heavily sclerotized area Y-shaped; tegumen broadest anteriorly, saccus broadly U-shaped; aedeagus slightly shorter than combined lengths of uncus, tegumen, and saccus, with slender, tapering, sclerotized projection posteriorly; vesica unarmed. Abdomen with both sets of tufts on A_8 present, outer ones shorter and heavier than inner and arising from basal sack-like protuberance; posterior double comb consisting of about 10 or 11 modified, well-spaced setae medially on each side, laterally with numerous setae very closely spaced.

FEMALE GENITALIA: Unknown.

TYPES: Holotype, male, Sierra del Libane, Colombia, elevation 6000 feet (H. H. Smith); paratypes, same data, two males. The holotype and paratypes are in the collection of the British Museum (Natural History).

RANGE: Colombia, known only from the type locality.

REMARKS: Three specimens and two genitalic dissections were studied. *Melanolophia dextera* is very similar to the preceding species. In size, color, and maculation it is almost identical with *reducta borea*, which occurs in the same area.

The male genitalia of the present species can be distinguished by the broader uncus and by the long process of the right valve. In *reducta borea* the left process is the longer of the two, while in *reductaria* the right process is slightly longer than the left, but the uncus is very slender.

Melanolophia isoforma, new species

Plate 6, figure 11; text figures 53, 136

A large species, occurring in Colombia, that is very similar to the preceding ones. The ground color of the upper surface of the wings

is a pale ochraceous buff, and the females have the outer part of the wings more or less contrasting with the basal portion. The genitalia should be used for accurate determination.

MALE: Head, thorax, and abdomen like those of *reductaria*.

UPPER SURFACE OF WINGS: Forewings with ground color pale ochraceous buff, overlain with ochraceous and brown scales; maculation and hind wings like those of *reductaria*.

UNDER SURFACE OF WINGS: Like that of *reductaria*, but without subterminal band on wings.

LENGTH OF FOREWING: 23 to 24 mm.; holotype, 23 mm.

FEMALE: Similar to male, but with upper surface of wings slightly paler, cross lines more clearly indicated in some specimens, and with t. p. and s. t. lines tending to be broadly shaded distally with dark brown or dark ochraceous brown, contrasting with basal area of wing. Under surface similar to that of male, but more heavily overlain with dark brown scales and with outer portion of wing darkened.

LENGTH OF FOREWING: 23 to 25 mm.; allotype, 23 mm.

MALE GENITALIA: Uncus narrowed from broad base, sides concave, terminal portion wide, with parallel sides, slightly concave ventrally, apex truncate, with two widely spaced, strong points; socius represented by from four to seven setae; gnathos with median area rugose, outer margins subparallel, distally with strong median lobe; each valve with prominent costal tubercle and tuft of elongate setae; valvula without spine patch; processes of valves asymmetrical, of similar shape but one on left side longer; right process slender, slightly curved medially, outer portion slightly more heavily sclerotized in distal one-half, with band of setae, very short basally, becoming longer distally, terminating before apex, with single, curved, heavy spine near apex on outer surface, process extending short distance beyond tegumen; left process extending to apex of uncus, very similar to right side but with apical portion more elongate; anellus with small base, sharply narrowed medially, broadly expanded distally, with posterior margin rounded or slightly concave; tegumen with parallel sides, saccus broadly U-shaped; aedeagus

slightly shorter than combined lengths of uncus, tegumen, and saccus, with slender, tapering, sclerotized projection posteriorly; vesica unarmed. Abdomen with both sets of tufts on A_3 present, outer ones shorter and heavier than inner and arising from basal sack-like protuberance; posterior double comb consisting of about eight to 11 modified, well-spaced setae medially on each side, laterally with numerous setae very closely spaced.

FEMALE GENITALIA: Sterigma with prominent elliptical genital plate, narrower and more heavily sclerotized anterior to sinus vaginalis, extending posteriad thereof as larger, more membranous area; lamella antevaginalis large, evenly rounded, sclerotized, flat, lip-like process, in length subequal to length of sinus vaginalis; lamella postvaginalis an elongate projection, in length about one and one-half times as long as lamella antevaginalis, basally tapered from broad base, posteriorly with deep median incision; ductus bursae very short, membranous, tapering, and joining corpus bursae dorsally; corpus bursae elongate, curved and slightly enlarged distally; signum minute.

TYPES: Holotype, male, Monte Tolima, [Tolima], Colombia, February, 1910, elevation 2700 meters (A. H. Fassel); allotype, female, same data, elevation 2800 meters. Paratypes, all from Colombia: Cañon del Tolima, [Tolima], December, 1909, elevation 3000 meters (A. H. Fassel), one male; Paso del Quindiu, "Cent. Cord.," elevation 3500 meters (Fassel), one female; Monte Tolima, [Tolima], elevation 3200 meters, one female. The holotype and allotype are in the collection of the British Museum (Natural History); paratypes are in the collections of that institution and of the United States National Museum.

RANGE: Colombia (the department of Tolima). All the material examined came from the Cordillera Central, at elevations of from about 8900 to 11,500 feet. The only dates of capture were February and December.

REMARKS: Five specimens and five genitalic dissections were studied. This species is very similar to most of the preceding ones, but it is apparently found at higher altitudes than any of the others.

The male genitalia are distinctive in the shape of the uncus, and in the similarly shaped processes of the valves, with the left process being longer. The lamellae of the female genitalia are well developed, with a very short, membranous ductus bursae.

***Melanolophia isometra*, new species**

Plate 6, figure 12; text figure 54

This species has the upper surface of the wings slightly grayer or more grayish brown than does *isoforma*, but otherwise the two are very much alike. The female of the present species is unknown. The genitalia offer the best means of determination. This species is found in Ecuador.

MALE: Head, thorax, and abdomen like those of *reductaria*.

UPPER SURFACE OF WINGS: Forewings with ground color pale grayish buff or pale grayish brown, overlain with ochraceous and brown scales; maculation and hind wings like those of *reductaria*.

UNDER SURFACE OF WINGS: Like that of *reductaria*, with subterminal band tending to be nebulous but present in most specimens.

LENGTH OF FOREWING: 21 to 24 mm.; holotype, 22 mm.

FEMALE: Unknown.

MALE GENITALIA: Uncus narrowed from broad base, sides concave, terminal portion wide, with parallel sides, concave ventrally, apex rounded, with ventral rim and small median point; socius represented by from four to seven setae; gnathos with median area rugose, outer margins outwardly divergent, distally with strong median lobe or protuberance; each valve with prominent costal tubercle and tuft of elongate setae; valvula without spine patch; processes of valves symmetrical, extending to middle of uncus, slender, weakly S-shaped, outer portion with slightly more heavily sclerotized strip on outer side, with band of short setae beginning on ventral surface, becoming slightly longer and curving around outer margin to dorsal surface near bluntly pointed apex, and with single, heavy, posteriorly directed dorsal spine; anellus with moderately small base, sharply narrowed medially, broadly expanded distally and curved dorsally; tegumen with parallel sides, saccus broadly U-shaped; aedeagus slightly shorter than combined lengths of uncus, tegu-

men, and saccus, with slender, tapering, slightly curved, sclerotized projection posteriorly; vesica unarmed. Abdomen with both sets of tufts on A_3 present, outer ones shorter and heavier than inner and arising from basal sack-like protuberance; posterior double comb consisting of about 10 or 11 modified, well-spaced setae medially on each side, laterally with numerous setae very closely spaced.

FEMALE GENITALIA: Unknown.

TYPES: Holotype, male, "Environs de Loja," [Loja], Ecuador, 1891. Paratypes, all from Ecuador: Same data as type, 1887, 1889, 1890, 1891, 1893, 27 males; El Monje, "prés Loja," [Loja], without date and 1893, two males; San Francisco, Loja, August, 1880, one male; Loja, two males. The holotype is in the collection of the United States National Museum; paratypes are in the collections of that institution, and of the British Museum (Natural History).

RANGE: Ecuador (the province of Loja). All the material examined was captured in the vicinity of Loja, and the only month of capture known is August.

REMARKS: Thirty-three specimens and seven genitalic dissections were studied. This species is closely allied to *isoforma*, but can be distinguished by the uncus and by the fact that the processes of the valves are of equal length.

***Melanolophia attenuata*, new species**

Plate 6, figure 13; text figures 55, 137

This species is slightly smaller than any of the preceding group of three. The males have the same coloration and type of maculation, although the cross lines are more weakly represented, while the females are similar to the males in color and pattern. The genitalia offer the best means of identification; *attenuata* is unique in having the male structures extremely long and attenuate. This species occurs in Central America.

MALE: Head, vertex and front pale buff, former with scattered dark brown scales, latter with dark brown across top and laterally by eyes; palpi pale buff at base, becoming brown or dark brown terminally. Thorax pale buff above, with a few scattered dark brown scales; collar slightly darker in some specimens, becoming darker at apex;

patagia concolorous with thorax, with very narrow, blackish brown, transverse band; below, and legs, pale buff, latter marked with pale brown and brown scales. Abdomen pale buff or pale grayish buff above, with scattered dark brown scales, lighter basally, terminally, and below.

UPPER SURFACE OF WINGS: Forewings with ground color pale buff, sparsely overlain with brown scales; cross lines brown, varying from being moderately strong to being obsolescent, quite similar to those of *reducta*; t. a. line with inward bend in cell, then proceeding more or less straight to inner margin, shaded basally in some specimens at inner margin; median line weak, arising from costal spot, tending to be straight in course; discal spot black, prominent; t. p. line outwardly toothed on vein M_1 , convex and weak in middle of wing, slightly concave and more strongly represented below, shaded distally by black spots on both sides of anal vein, weakly shaded distally opposite cell in some specimens; subterminal and terminal areas concolorous with, or very slightly darker than, basal portion of wing; s. t. line prominent in upper part of wing, absent below; terminal area with apex broadly pale gray to vein R_5 or M_1 , with cells M_1 and M_2 , and sometimes R_5 , more or less heavily shaded with brownish black scales; terminal line of black intravenular spots, small or obsolescent; fringe concolorous with wing. Hind wings concolorous with forewings, similar to those of *reducta*.

UNDER SURFACE OF WINGS: Unicolorous pale buff or pale grayish brown, heavily overlain with brown or grayish brown scales and strigations except at paler apex and along inner margin of forewings; hind wings slightly paler than forewings; discal spots and maculation weakly reflected from upper side, with subterminal band present in some specimens.

LENGTH OF FOREWING: 20 to 22 mm.; holotype, 21 mm.

FEMALE: Similar to male, but with upper surface of wing more heavily overlain with ochraceous or brown scales, with t. p. and s. t. lines tending to be more strongly shaded distally on all wings. Under surface similar to upper, with outer area darkened in some specimens.

LENGTH OF FOREWING: 20 to 22 mm.; allotype, 21 mm.

MALE GENITALIA: Uncus tapering from wide base, ventral portion swollen below apex, then tapering to elongate, single point; socius represented by about five to eight setae; gnathos small, enlarged and deeply bifurcate medially, with rugose lobes; each very long and slender valve with costal tubercle and tuft of elongate setae; valvula without spine patch, but with anterior setae thicker than posterior ones; processes of valves strongly asymmetrical, one on right side very long, left one vestigial; right process very long and slender, gently curved, swollen near end, with outwardly curving, tapering, sharply pointed apex extending to middle of uncus; left process represented by very small basal process only; anellus very long, slightly narrowed medially, bluntly rounded posteriorly, with central portion more heavily sclerotized; tegumen and saccus very long and narrow, widest posteriorly, with small median lobe anteriorly; aedeagus slightly shorter than combined lengths of uncus, tegumen, and saccus, with very slender, curved, sclerotized projection posteriorly and with slightly capitate anterior end; vesica unarmed. Abdomen with both sets of tufts present on A_3 , outer ones shorter and heavier than inner and arising from basal sack-like protuberance; posterior double comb consisting of about 10 to 13 modified, well-spaced setae medially on each side, laterally with numerous setae very closely spaced.

FEMALE GENITALIA: Sterigma with lightly sclerotized genital plate extending posteriad of sinus vaginalis; lamella antevaginalis large, sclerotized, extending well posteriad of sinus vaginalis as large median lobe; lamella postvaginalis elongate, slender, about one-half of length of lamella antevaginalis, gently tapering, with apex weakly bifurcate; ductus bursae very long, rugose, angled dorsally anterior of middle, curved anteriorly to join corpus bursae dorsally; corpus bursae about twice as long as ductus bursae, slightly enlarged anteriorly; signum of moderate size.

TYPES: Holotype, male, and allotype, female, Mt. Poas, Costa Rica, May (Schaus and Barnes). Paratypes: *Costa Rica*: Tuis, August 28, 1908, elevation 5800 feet, one male; Port Limon, May, 1907, one male; Juan Vinas, June (Schaus and Barnes), one male; Orosi, elevation 1200 meters (Fassl), one male, three

females. *Panama*: Chiriqui, one male. The holotype and allotype are in the collection of the United States National Museum; paratypes are in the collections of that institution and of the British Museum (Natural History).

RANGE: Costa Rica and Panama (the province of Chiriqui). All the specimens, except one, are from the higher mountains at elevations of from 3200 to 5800 feet; the one exception is labeled Port Limon, Costa Rica, which is at sea level. The moths have been captured in May, June, and August.

REMARKS: Ten specimens and eight genitalic dissections were studied. This species resembles a pale, weakly marked *reducta*. The genitalia of both sexes are very different from those of any other species in the genus, and these offer the safest means of identification.

***Melanolophia argilaria* (Guenée)**

Plate 6, figure 14; text figure 56

Tephrosia argilaria GUENÉE, 1857, p. 263. WALKER, 1860, p. 410. OBERTHÜR, 1913, fasc. 7, p. 281, pl. CLXX, fig. 1667 (female).

Melanolophia argilaria: PROUT, 1910a, p. 341.

This is a medium-sized species, very similar in color and maculation to the preceding species of this group. It is almost identical with *attenuata*, but the genitalia are quite distinct. This species is the first of several that have the uncus swollen but not capitate or bilobed. The female has not been examined, although this sex was illustrated by Oberthür. According to his figure, if it be assumed that the sexes are properly associated, the female is rather similar to the male. *Melanolophia argilaria* is known from Colombia.

MALE: Head, thorax, and abdomen like those of *attenuata*.

UPPER SURFACE OF WINGS: Forewings with ground color pale ochraceous brown, sparsely overlain with brown scales; maculation like that of *attenuata*, but with cross lines tending to be slightly more sinuate. Hind wings like those of *attenuata*.

UNDER SURFACE OF WINGS: Unicolorous pale ochraceous brown, more or less heavily overlain with brown and dark brown scales and strigations except at paler apex and along inner margin of forewings; hind wings slightly paler than forewings; discal spots and maculation weakly reflected from upper side, with

subterminal band moderately to strongly represented.

LENGTH OF FOREWING: 20 to 21 mm.

FEMALE: Not examined. Oberthür's figure (1913, fasc. 7, pl. CLXX, fig. 1667) indicates that the t. a., t. p., and s. t. lines are slightly more heavily indicated, and that the last is straighter and nearer the t. p. line in the middle of the wing, as compared with those of the male. On the upper surface of the secondaries the extradiscal line is more dentate, and the under surface is paler than that of the male.

LENGTH OF FOREWING: 20 mm. (Oberthür's figure).

MALE GENITALIA: Uncus tapering, swollen distally, with apex bluntly rounded; socius represented by three or four setae; gnathos broadly swollen, with large, rugose, median area, slightly tapered laterally, then concave, with large median lobe; each valve with costal tubercle and tuft of elongate setae; valvula without spine patch; processes of valves of nearly same size and shape; right process with broad base, curved and narrowed medially, broadly swollen apically to occupy most of width of valve, outer portion rounded and spinose, inner section extended as short, bluntly pointed, rugose projection, extending slightly beyond end of anellus; left process with anterior part similar to right process, apically swollen, globular, outer portion and dorsally with short setae; anellus sharply constricted medially from large anterior portion, wider posteriorly, caudal portion enlarged, with small median indentation on posterior margin; tegumen widest posteriorly, saccus bluntly rounded; aedeagus slightly shorter than combined lengths of uncus, tegumen, and saccus, with small, curved, sclerotized projection posteriorly; vesica unarmed. Abdomen with both sets of tufts present on A₃, outer ones shorter and heavier than inner and arising from basal sack-like protuberance; posterior double comb consisting of about nine or 10 modified, well-spaced setae medially on each side, laterally with numerous setae very closely spaced.

FEMALE GENITALIA: Not examined.

TYPES: Guenée described *argilaria* from one male and one female. The male is hereby designated as the lectotype; it is in the collection of the British Museum (Natural History). Oberthür (1913) figured the female,

which is now in the collection of the Muséum National d'Histoire Naturelle, Paris.

TYPE LOCALITY: Colombia.

RANGE: Colombia. (See Appendix for locality data of specimens examined.)

REMARKS: Two specimens and two genitalic preparations were studied. One of these was the lectotype and the other was from the Felder collection; neither of these has a locality label, but Colombia is given in the original description as the locality of the types. If the figure by Oberthür is accurate, there is the possibility that the male and female types are not conspecific. Several things about the maculation of the type female do not agree very well with the two males examined. More material is needed before this problem can be settled.

The male genitalia can be distinguished by the subtriangular uncus and by the strongly capitate processes of the valves.

***Melanolophia synargilaria*, new species**

Plate 6, figure 15; text figure 57

This is a large species, occurring in Peru, which is very similar to *reducta meridiana*, although the upper surface is slightly grayer in color. The genitalia should be used for determination; the male structures show that this species is very closely allied to *argilaria*.

MALE: Head, thorax, and abdomen like those of *reducta*.

UPPER SURFACE OF WINGS: Forewings with ground color pale grayish buff, overlain with a few scattered brown and dark brown scales; maculation and hind wings like those of *reducta meridiana*.

UNDER SURFACE OF WINGS: Unicolorous pale buff, heavily overlain with grayish brown and brown scales and strigations except at paler apex, outer margins of all wings, and inner margin of forewings; discal spots and maculation reflected from upper surface, and all wings with heavy subterminal band.

LENGTH OF FOREWING: 23 mm. (holotype).

FEMALE: Unknown.

MALE GENITALIA: Uncus tapering, swollen distally, with apex bluntly rounded; socius represented by three or four setae; gnathos very large, rugose, rounded, with slightly uneven, angulate edge, and with small indentation medially, left side of indentation appearing slightly larger than right; each valve

with costal tubercle and tuft of elongate setae, and with truncate anterior margin of lightly sclerotized sacculus; valvula without spine patch, but with anterior setae arising from swollen area; processes of valves of same size and shape, with left one minutely longer, extending to just beyond anellus, with narrow, curved, basal region about four-sevenths of length of process, broadly swollen apically and globular, occupying most of width of valve, with small ridge on posterior surface and with numerous short setae on outer surface, basal and apical portions connected ventrally by small, thin ridge; anellus sharply constricted medially from large anterior portion, wider posteriorly, caudal portion enlarged, with small median indentation on posterior margin; tegumen widest anteriorly, saccus bluntly rounded; aedeagus slightly shorter than combined lengths of uncus, tegumen, and saccus, with small, curved, sclerotized projection posteriorly, and curved medially; vesica unarmed. Abdomen with both sets of tufts present on A_3 , outer ones shorter and heavier than inner and arising from basal sack-like protuberance; posterior double comb consisting of 11 or 12 modified, well-spaced setae medially on each side, laterally with numerous setae very closely spaced.

FEMALE GENITALIA: Unknown.

TYPE: Holotype, male, Chachapoyas, Amazonas, Peru, 1889 (M. de Mathan). This specimen is in the collection of the British Museum (Natural History).

RANGE: Peru (the department of Amazonas). The single specimen was taken at Chachapoyas, where the elevation is about 7600 feet.

REMARKS: One specimen and one genitalic preparation were studied. This species is almost identical with *reducta meridiana* on the upper surface of the wings, but beneath, the wings are more heavily marked with dark scales, and a prominent subterminal band is present.

The male genitalia indicate a close relationship to *argilaria*, as both species have a similar type of uncus and processes of the valves. In *synargilaria*, the latter have a more globular outer portion, and the gnathos is much larger and of a different shape than that in *argilaria*.

Melanolophia commotaria (Maassen),
new combination

Plate 6, figure 16; text figures 58, 138

Boarmia commotaria MAASSEN, in Stübel, 1890, p. 158, pl. 8, fig. 10 (type).

This large species occurs in northwestern South America. It is very similar to the preceding species, but the males are slightly darker and have the maculation more contrasting in color. The females have the outer portion of the wings much darkened and contrasting. Once again the genitalia offer the safest way to identify the species.

MALE: Head, thorax, and abdomen like those of *attenuata*.

UPPER SURFACE OF WINGS: Forewings with ground color pale ochraceous buff or pale grayish brown, sparsely overlain with ochraceous and brown scales; maculation like that in *reducta*, with stronger costal spot for median line, and with upper and lower portions of t. p. line more strongly shaded distally with dark brown. Hind wings like those of *detracta*.

UNDER SURFACE OF WINGS: Unicolorous pale ochraceous brown, heavily overlain with brown or dark grayish brown scales and strigations except at paler apex and along inner margin of forewings; hind wings slightly paler than forewings, tending to have fewer dark scales; discal spots and maculation more or less strongly reflected from upper surface, with strong subterminal band present on all wings.

LENGTH OF FOREWING: 22 to 24 mm.

FEMALE: Similar to male, but with upper surface of wings paler, with cross lines more heavily indicated, and with area beyond t. p. line dark brown or dark grayish brown, contrasting with basal portion of wing. Under surface similar to upper surface but with dark brown scaling.

LENGTH OF FOREWING: 23 to 24 mm.

MALE GENITALIA: Uncus gradually tapering from broad base, terminal portion wide, with slight lateral projection, apex broadly rounded; socius represented by about four or five setae; gnathos broadly swollen, heavily sclerotized, produced into two large, rugose, outer lobes, left one slightly larger than right, concave between, with slightly smaller median lobe; each valve with prominent costal

tubercle and tuft of elongate setae; valvula without spine patch, but with strongly raised setose ridge basal to costal tubercle; processes of valves asymmetrical, one on right side about one and one-half times longer than that on left; right process arising from slender, gently curved, basal section, posterior one-half swollen, about three times wider than basal section, concave medially on inner side, surface covered with short spines, and with band of longer setae on outside, curving inwardly on dorsal surface near rounded apex and terminating in very broad spine, the process extending to base of uncus; left process extending to posterior portion of anellus, basally as in right process, then swollen to form a large, globular end piece, with dorsal surface covered with short spines, outer surface with broad area of longer, dorsally curving setae; anellus with weakly sclerotized base, sharply constricted medially and produced posteriorly as two lateral arms, Y-shaped; tegumen with parallel sides, saccus elongate, U-shaped; aedeagus slightly shorter than, or subequal to, combined lengths of uncus, tegumen, and saccus, with elongate, tapering, sclerotized projection posteriorly; vesica unarmed. Abdomen with both sets of tufts on A_3 present, outer ones shorter and heavier than inner and arising from basal sack-like protuberance; posterior double comb consisting of about 10 to 12 modified, well-spaced setae medially on each side, laterally with numerous setae very closely spaced.

FEMALE GENITALIA: Sterigma with prominent, transversely oval or elliptical genital plate, made up of heavily sclerotized, more or less concentric ridges around sinus vaginalis, extending posteriad thereof as more membranous area; lamella antevaginalis very large, sclerotized, semicircular, wider than long, extending well posteriad of sinus vaginalis; lamella postvaginalis large, sclerotized, largest part situated to left of mid-line, in form of posteriorly tapering, apically truncate cone, with base cut diagonally, occupying part of left side of sinus vaginalis; ductus bursae short, weakly sclerotized, from right side of sinus vaginalis, tapering to join corpus bursae dorsally; corpus bursae slightly enlarged anteriorly, with lightly sclerotized and rugose posterior arm to ductus bursae; signum small.

TYPE: The unique male is in the Zoologisches Institut und Museum der Humboldt-Universität, Berlin.

TYPE LOCALITY: Between Baños, [Tungurahua], and Jivaria del Píntuc, [Napo-Pastaza], Ecuador, elevation 900–1500 meters.

RANGE: Venezuela, Colombia (the departments of Tolima and Valle del Cauca), and Ecuador (the provinces of Tungurahua, Napo-Pastaza, and Loja). This species has been taken in the mountainous regions from about 3000 to 7000 feet in elevation during the months of March, August, October, November, and December. (See Appendix for locality data of specimens examined.)

REMARKS: Twenty specimens and 13 genitalic dissections were studied. This species is larger and darker than *argilaria*, which also occurs in Colombia, and has more contrasting maculation.

The male genitalia of *commotaria* have a much larger gnathos and a longer process of the right valve than are to be found in *argilaria*. The female genitalia of *commotaria* are unlike those of any of the preceding species of this group, as the lamella postvaginalis is asymmetrically situated, being on the left side.

Melanolophia dislocata (W. Warren),
new combination

Plate 6, figure 17; text figure 59

Cymatophora dislocata W. WARREN, 1904, p. 108.

Melanolophia dislocata is a large, pale species, with contrasting deep brown maculation. It is very similar to the preceding species, but it can usually be distinguished by the faintly yellowish ground color of the wings. The female is unknown. An examination of the genitalia is the best means for safe identification. This species occurs in Peru.

MALE: Head, thorax, and abdomen like those of *reducta*, with thorax tending to be slightly paler.

UPPER SURFACE OF WINGS: Forewings with ground color creamy or pale ochraceous buff, with scattered dark brown and ochraceous brown scales; maculation like that in *reducta*, with outward bends of t. a. line filled with dark brown scales, and with t. p. line prominently shaded distally at upper and lower

portions. Hind wings like those of *detracta*.

UNDER SURFACE OF WINGS: Unicolorous ochraceous brown or pale buff, heavily overlain with brown or dark grayish brown scales and strigulations except at paler apex and along inner margin of forewings; hind wings slightly paler than forewings, tending to have fewer dark scales; discal spots and maculation more or less strongly reflected from upper surface.

LENGTH OF FOREWING: 20 to 24 mm.

FEMALE: Unknown.

MALE GENITALIA: Uncus narrowed from broad base, sides concave, terminal portion broad, scoop-shaped, apically rounded, ventral surface concave; socius represented by five or six setae; gnathos broadly swollen medially, in form of flat, subrectangular or rounded, rugose projection; each valve with prominent costal tubercle and tuft of elongate setae; valvula without spine patch; processes of valves asymmetrical, one on right side about twice as long as that on left; right process with basal one-third narrow, then becoming slightly wider, more heavily sclerotized and flattened, with narrow band of short, closely appressed setae on distal margin, curving dorsally and becoming longer just before apex, extending beyond apex apically and on inner side, with process extending beyond end of uncus; left process extending shortly beyond anellus, with basal portion like that on right side, then swollen on outer side to form an elongate, capitate projection, with very thick group of short setae on outer surface; anellus with small, subrectangular base, sharply narrowed medially, broadly expanded distally into weakly Y-shaped structure; tegumen with parallel sides, saccus elongate, broadly U-shaped; aedeagus subequal in length to combined lengths of uncus, tegumen, and saccus, with very slender, tapering, sclerotized projection posteriorly; vesica unarmed. Abdomen with both sets of tufts on A_3 present, outer ones shorter and heavier than the inner and arising from basal sack-like protuberance; posterior double comb consisting of about 10 or 11 modified, well-spaced setae medially on each side, laterally with numerous setae very closely spaced.

FEMALE GENITALIA: Unknown.

TYPE: Warren described *dislocata* from a

single male; this specimen is in the collection of the British Museum (Natural History).

TYPE LOCALITY: Peru.

RANGE: Peru (the departments of Piura, Pasco, Puno, Amazonas, Huánuco, and San Martín). This species occurs in the mountainous regions at elevations of from about 3100 to "6-10,000" feet. Most of the specimens are without date of capture; the only month that is indicated is June. (See Appendix for locality data of specimens examined.)

REMARKS: Forty specimens and nine genitalic dissections were studied. The ground color of the upper surface of this species tends to be cream-colored or faintly yellow in most specimens, while a few others are a pale ochraceous buff. The maculation is quite dark and contrasting on this pale background.

The male genitalia are quite distinctive in that they have a scoop-shaped uncus and the slender process of the right valve is twice as long as the capitate process of the left valve.

Melanolophia mutabilis (W. Warren),
new combination

Plate 6, figure 18, plate 7, figure 1;
text figures 60, 139

Cymatophora mutabilis W. WARREN, 1897, p. 466.

Cymatophora mutabilis ab. *fasciata* W. WARREN, 1897, p. 467.

This is a medium-sized species that occurs on Jamaica and in the Guianas. It has the forewing angulate at vein M_3 . There are two forms of maculation in both sexes, one in which the cross lines are but weakly indicated, and the second with the t. a. line shaded basally and the t. p. line broadly shaded distally with dark brown. The females are similar to the males but are slightly paler. This species is the first of several in which the uncus is widened at the apex, and in which the sterigma is membranous and funnel-like.

MALE: Head, vertex and front buff or pale buff, with a few scattered brown scales; palpi buff or pale buff, with scattered brown scales. Thorax buff above, with scattered brown scales; collar and patagia concolorous with thorax, latter with weak, narrow, transverse band medially; below, and legs, slightly paler, latter variably spotted with brown. Abdomen buff, with brown scaling above, paler below.

UPPER SURFACE OF WINGS: Forewings with ground color buff or pale ochraceous brown, with scattered brown scales; cross lines weakly indicated, ochraceous or brown; t. a. line with slender costal spot, broadly shaded basally with dark brown in some specimens; median line represented by costal spot, obsolescent across wing, discal spot dark brown or blackish brown, small; t. p. line subparallel outer margin, passing about 4 mm. from discal spot, tending to become partially obsolescent in middle of wing in some specimens, angled in cell Cu_2 , either weakly shaded distally opposite cell and above inner margin or entire line broadly shaded distally with dark brown; s. t. line represented by several dark spots down to cell M_2 , with spots in cells M_1 and M_2 shaded distally, and with spots above tornus; apex of wing concolorous with terminal area; terminal line of black intravascular spots, obsolescent in lower part of wing; fringe concolorous with wing. Hind wings concolorous with forewings; median shade line obsolescent; discal spot dark, small; extradiscal line more or less straight, obsolescent in anterior part of wing, either weakly shaded distally or broadly shaded with dark brown; outer portion of wing like that on forewing.

UNDER SURFACE OF WINGS: Unicolorous buff, more or less heavily overlain with brown or grayish brown scales and strigulations except along inner margin of forewings; hind wings concolorous with forewings; discal spots and maculation reflected from upper surface.

LENGTH OF FOREWING: 18 to 20 mm.

FEMALE: Similar to male, but with upper surface of wings slightly paler, and with t. p. line shaded distally with dull brown or dark brown in subterminal area. Under surface similar to upper but with maculation less clearly defined.

LENGTH OF FOREWING: 17 to 21 mm.

MALE GENITALIA: Uncus tapering from broad base, terminally swollen, with apical portion flattened, roughly T-shaped, with lateral points extended in some specimens; socius represented by from four to six setae; gnathos enlarged medially into flattened, broadly bifurcate projection, curving posteroventrally, dorsal surface rugose; each valve with small costal swelling; valvula with

raised ridge with numerous setae, interrupted in middle; processes of valves asymmetrical but of approximately same length; right process arising from broad base, narrow, becoming slightly more heavily sclerotized posteriorly, apical one-third curving inwardly, then posteriorly, and having numerous, short, closely appressed setae, process extending almost as far as end of uncus; left process as long as, or very slightly longer than, right one, with short basal area, terminal four-fifths more heavily sclerotized, tubular, straight, with band of short, closely appressed setae on inner side basally, spreading over entire surface distally; anellus with subrectangular base, gradually tapering posteriorly, then broadly swollen on each side terminally; tegumen broadest posteriorly, saccus slightly narrowed posteriorly and with small, median projection anteriorly; aedeagus slightly shorter than combined lengths of uncus, tegumen, and saccus, with elongate, tapering, sclerotized projection posteriorly, an elongate, narrowed anterior end, and several longitudinal striations on dorsal surface; vesica unarmed. Abdomen with both sets of tufts on A_3 present, outer ones shorter and heavier than inner and arising from basal sack-like protuberance; posterior double comb consisting of about 10 to 12 modified, well-spaced setae medially on each side, laterally with numerous setae very closely spaced.

FEMALE GENITALIA: Sterigma with membranous genital plate, sinus vaginalis at base of large, funnel-like depression formed by sterigma and posterior margin of abdominal segment; lamella antevaginalis absent; lamella postvaginalis very long, slender, well sclerotized, in length equal to length of apophyses anteriores, of equal width throughout or slightly tapering, apex bifurcate; ductus bursae short, tapering, membranous, joining corpus bursae dorsally; corpus bursae with anterior end slightly swollen, curved, posteriorly weakly striate; signum small.

TYPES: The types of both *mutabilis* and of *fasciata* are in the British Museum (Natural History).

TYPE LOCALITIES: Jamaica (*mutabilis* and *fasciata*).

RANGE: The island of Jamaica and British Guiana. The only known month of capture is

May. (See Appendix for locality data of specimens examined.)

REMARKS: Fourteen specimens and 10 genitalic dissections were studied. *Melanolophia mutabilis* is a relatively small, weakly marked (except for the banded form) species having angulate forewings and lacking the pale apex to the primaries that is found in most of the species of this group.

The structure of the male genitalia, particularly of the uncus, places this species in group VI. The capitate uncus distinguishes it from any of the preceding, as does the membranous, funnel-shaped sterigma, with the sinus vaginalis at the bottom.

***Melanolophia venatia*, new species**

Plate 7, figure 2; text figure 140

This species is slightly larger than *mutabilis*, and the upper surface of the wings is of a paler, more buff color. The apical area of the forewing in the female is pale. The species occurs in Bolivia.

MALE: Unknown.

FEMALE: Head, thorax, and abdomen similar to those of *mutabilis*; front with large depression between eyes in one specimen.

UPPER SURFACE OF WINGS: Forewings with ground color pale buff, overlain with pale grayish brown and brown scales; cross lines moderate to obsolescent; t. a. and median lines like those of *mutabilis*; t. p. line complete, thin, outwardly dentate on veins, passing about 2 mm. from discal spot, shaded distally above inner margin by brownish black scales; subterminal area concolorous with basal portion of wing; s. t. line represented by contiguous spots anteriorly, becoming obsolescent posteriorly; terminal area with apex of pale ground color, solidly shaded in cells R_5 , M_1 , and M_2 with brownish black scales; terminal line of weak intravenular dots; fringe concolorous with wing. Hind wings concolorous with forewings, similar to those of *mutabilis* but with outer margin more deeply crenulate.

UNDER SURFACE OF WINGS: Unicolorous pale grayish buff, overlain with pale brownish gray and brown scales, except at paler apex and along inner margin of forewings; hind wings concolorous with forewings; t. a., median, and t. p. lines absent or obsolescent; discal dots present on all wings; s. t. line

represented by brown band on all wings, and shaded distally below apex of forewings.

LENGTH OF FOREWING: 21 to 22 mm.; holotype, 21 mm.

MALE GENITALIA: Unknown.

FEMALE GENITALIA: Very similar to those of *mutabilis*, but with lamella postvaginalis slightly shorter and with wider apical incision, with corpus bursae longer, less curved anteriorly, and with anterior end somewhat angulate on one side.

TYPES: Holotype, female, Rio Songo, Bolivia, elevation 750 meters (Fassl). Paratypes, all from Bolivia: Incachaca, Cochabamba (J. Steinbach), two females. The holotype and paratypes are in the collection of the United States National Museum.

RANGE: Bolivia (the department of Cochabamba), taken at an elevation of 2460 feet.

REMARKS: Three specimens and two genitalic dissections were studied. This species can be distinguished from *mutabilis* by the different color of the wings, the dentate t. p. line, the unshaded subterminal area, and the light-colored apex with the solidly colored area just below it. These last two characters, plus a complete s. t. line, are also found on the under side.

The female genitalia of *mutabilis* and *venatia* are very similar; the differences are outlined in the description above.

***Melanolophia elegia*, new species**

Plate 7, figure 3; text figures 61, 141

That is another species that is similar to *reductaria*. The male is grayish brown, and the female is ochraceous brown. The genitalia of both sexes have good characters for distinguishing this species. This taxon occurs in Mexico.

MALE: Head, thorax, and abdomen similar to those of *reductaria*.

UPPER SURFACE OF WINGS: Forewings with ground color grayish brown, overlain with brownish gray scales; cross lines like those in *reductaria* but more weakly represented, having less shading to t. a. and t. p. lines except for latter above inner margin, with t. a. line less angulate in cell and t. p. line tending to have two outward points; subterminal area concolorous with basal portion of wing; terminal area with apex slightly paler than remainder of wing, followed by

prominent brownish black spot opposite cell. Hind wings like those of *reductaria*, but with outer margin more deeply crenulate.

UNDER SURFACE OF WINGS: Like that of *reductaria* but grayer, and with partial subterminal band below pale apex of forewing.

LENGTH OF FOREWING: 20 to 22 mm.; holotype, 22 mm.

FEMALE: Similar to male but with forewings above pale ochraceous brown, overlain with numerous ochraceous and a few brown scales; subterminal area of forewings with large, prominent, brownish black area in cell M_1 and in most of cells R_5 and M_2 . Under surface pale grayish buff, overlain with pale brownish gray and brown scales except at pale apex and along inner margin of forewing; maculation similar to that of male but more heavily represented.

LENGTH OF FOREWING: 20 to 23 mm.; allotype, 21 mm.

MALE GENITALIA: Uncus tapering from broad base, apical portion strongly enlarged, broad, roughly T-shaped; socius of from four to six setae; gnathos very wide dorsally, constricted ventrally, elongate medially, heavily sclerotized, apex rounded; each valve with prominent costal tubercle and tuft of elongate setae; valvula without spine patch, but with raised, sclerotized tubercle near base of costal tubercle, wider than high, apical area heavily covered with numerous dark, elongate setae; processes of valves very asymmetrical, one on right side about seven times as long as one on left; right process extending as very long, free arm from broad, shallow base, slightly tapering, curving medially, with narrow, longitudinal band, becoming finely setose apically, extending well beyond end of valve by distance varying from equal to to twice width of apical portion of uncus; left process extremely short and simple, subtriangular, not extending much beyond base of right process; anellus narrowed anteriorly, slightly swollen posteriorly, forming broad process; tegumen with prominent median extension widest posteriorly, saccus narrowed, rounded anteriorly; aedeagus slightly longer than combined lengths of tegumen and saccus, with tapering, sclerotized projection posteriorly, with anterior portion tapering, and with several longitudinal striations on dorsal surface; vesica unarmed. Abdomen

with both sets of tufts on A_2 present, outer ones fused together to form prominent, apically curved protuberances; posterior double comb consisting of 10 or 11 modified, well-spaced setae medially on each side, laterally with numerous setae very closely spaced.

FEMALE GENITALIA: Sterigma with membranous genital plate, sinus vaginalis at base of large, funnel-like depression formed by sterigma and posterior margin of abdominal segment; lamella antevaginalis absent; lamella postvaginalis elongate, in length about two-thirds or three-fourths of length of apophyses anteriores, smoothly sclerotized, slightly tapering, asymmetrical, extending farther anteriorly on left side, with left margin convex, right margin straight or very slightly concave beyond swollen, deeply concave base, apex shallowly bifurcate; ductus bursae short, tapering, membranous, joining corpus bursae dorsally; corpus bursae elongate, lightly sclerotized and rugose around ductus bursae; signum very small.

TYPES: Holotype, male, Vista Hermosa, Municipio Comaltepec, Oaxaca, Mexico, September 24, 1962, elevation 4650 feet (E. C. Welling); allotype, female, Puerto Elegio, Municipio Comaltepec, Oaxaca, Mexico, September 26, 1961, elevation 2296 feet (E. C. Welling). Paratypes, all from Mexico: Same data as holotype, September 22-29, 1962, October 16, 1962, four males; same data as allotype, September 26, 27, 1961, four females; Orizaba, Veracruz, July, 1907 (C. C. Hoffmann), one female, no date or collector, seven females, (R. Muller), one female; Jalapa, Veracruz, one female; Cordoba, [Veracruz], January 10, 1908 (Fredk. Knab), one female. The holotype and allotype are in the collection of the American Museum of Natural History; paratypes are in the collections of that institution and of the United States National Museum.

RANGE: Mexico (the states of Veracruz and Oaxaca). This species has been taken in the Tropical Wet and Dry Zone, at elevations from about 2000 to 4650 feet. The months of capture include January, July, September, and October.

REMARKS: Twenty-one specimens and 11 genitalic dissections were studied. This species is similar to *reductaria* in maculation.

Freshly caught specimens of this species are dimorphic in coloration, as the males are much grayer than the ochraceous brown females. In addition to the males from Oaxaca, another one, labeled Jalapa, Mexico, has been examined from the collection of the United States National Museum. The genitalia of this specimen were dissected; the abdomen had been glued on and it proved to be one of *dislocata* W. Warren. Probably the rest of the moth is actually *elegia*, but this specimen is not placed as part of the type series. The upper surface of the wings of this specimen are brown, darker and less ochraceous than those of the female, but with much less gray than is found in the type, which may be due to the age and resulting fading of the Jalapa male, or it may be that Veracruz males are less gray than males from Oaxaca.

The male genitalia can be recognized by the capitate uncus, by the extremely long process of the right valve, extending beyond the end of the valve, and by the sclerotized, setose tubercle at the base of the costal tubercle. The female genitalia are similar to those of *mutabilis*, but the lamella postvaginalis of *elegia* is asymmetrical and slightly smaller than that of *mutabilis*.

***Melanolophia mallea*, new species**

Plate 7, figure 4; text figures 62, 142

This is a large species that is very similar to *reductaria* in size, color, and maculation; the genitalia should be used for determination. The color and pattern of the wings of the females are like those of the males. This species occurs in the Andean region from Colombia to Bolivia, inclusive.

MALE: Head, thorax, and abdomen similar to those of *reductaria*.

UPPER SURFACE OF WINGS: Forewings with ground color pale buff or pale grayish brown, overlain with pale ochraceous, grayish brown, and brown scales; cross lines like those in *reductaria*, but more weakly represented, lacking shading to t. a. and t. p. lines, except for latter above inner margin in many specimens, and with t. p. line tending to be more dentate opposite cell; subterminal area concolorous with basal portion of wing; terminal area like that in *reductaria*. Hind wings like those in *reductaria*.

UNDER SURFACE OF WINGS: Like that in

reductaria, but with nebulous subterminal band below pale apex and dark area opposite cell.

LENGTH OF FOREWING: 20 to 24 mm.; holotype, 22 mm.

FEMALE: Similar to male, with upper surface of the wings more or less heavily overlain with brown scales, and with subterminal area tending to be slightly darkened. Under surface more heavily overlain with brown scales and with better defined subterminal band.

LENGTH OF FOREWING: 21 to 23 mm.; allotype, 22 mm.

MALE GENITALIA: Similar to those of *elegia*, differing mainly as follows: socius represented by about eight or 10 setae; valvula with anterior end of low row of elongate setae slightly swollen, membranous, completely covered with elongate, pale setae; process of right valve extending distad beyond apex of valve by distance equal to width of apical portion of uncus. Abdomen with both sets of tufts on A_3 present, outer ones fused together to form prominent, apically curved protuberances; posterior double comb consisting of about nine to 11 modified, well-spaced setae medially on each side, laterally with numerous setae very closely spaced.

FEMALE GENITALIA: Sterigma with prominent genital plate, slender anterior to sinus vaginalis, becoming membranous posteriorly and on left side, rim around sinus vaginalis swollen, sclerotized, asymmetrical; lamella antevaginalis a low, lip-like structure around sinus vaginalis, lamella postvaginalis arising from lip between posterior portions of lamella antevaginalis, in length about one-third of length of apophyses anteriores, slender, tapering to apex; ductus bursae short, lightly sclerotized and rugose, joining corpus bursae dorsally; corpus bursae elongate, lightly sclerotized and rugose around junction with ductus bursae; signum small.

TYPES: Holotype, male, Chanchamayo, [Pasco], Peru (Schuncke); allotype, female, La Oroya, R[io] Inambari, [Puno], Peru, September, 1904 (dry season), elevation 3100 feet (G. Ockenden). Paratypes: Peru: Same data as holotype, 15 males; La Merced, Chanchamayo, [Pasco] (Schuncke), two males, September 8, 10, 1951 (Rivas), two males; Chachapoyas, Amazonas, 1889 (M. de

Mathan), 13 males; River Tabaconas, northern Peru, 1912, elevation 6000 feet (A. E. and F. Pratt), one male; Huambo, "IV Trim 1889" (M. de Mathan), six males; Santo Domingo, Carabaya, [Puno], May, October, 1902 (dry season), November, 1901 (wet season), elevation 6000–6500 feet (Ockenden), four males; Cerro de Pasco, Huancabamba, elevation 6000–10,000 feet (E. Boettger), three males; Pozuzu, Huánuco, elevation 800–1000 meters (W. Hoffmanns), (I. Egg), three males; no further data, three males. *Bolivia*: Chulumani, [La Paz], January, 1901, December (wet season), elevation 2000 meters (Simons), 10 males; Charaplaya, [Cochabamba], June, July, 1901, elevation 1300 meters (Simons), three males; R[i]o Solocame, [Cochabamba], January, 1901, elevation 1200 meters (Simons), two males; Yunga del Espiritu Santo, Cochabamba, 1888–1889 (P. Germain), four males; Incachaca, Cochabamba (J. Steinbach), one male; Rio Songo, elevation 750 meters (Fassl), one male; no further data, one male. *Ecuador*: "Environs de Loja," [Loja], 1889, 1890, 1891, eight males; Zamora, [Loja], May, 1886, 1893, two males; Palanda, [Santiago-Zamora], July, 1886, one male. *Colombia*: Popayan, [Caqueta] (Lehmann), nine males; "Ob. Rio Negro, Ost Colombia," elevation 800 meters (Fassl), one female. The holotype and allotype are in the collection of the British Museum (Natural History); paratypes are in the collections of that institution, of the United States National Museum, and of the American Museum of Natural History.

RANGE: Colombia (the department of Caqueta), Ecuador (the provinces of Loja and Santiago-Zamora), Peru (the departments of Junin, Amazonas, Piura, Puno, and Huánuco), and Bolivia (the departments of La Paz and Cochabamba). This is a montane species that has been captured at elevations of from about 2500 to 6500 feet. The months of capture have been in both the wet (November, December, January) and dry (May, June, July, September, and October) seasons.

REMARKS: Ninety-seven specimens and 21 genitalic preparations were studied. This species, in appearance, is like a pale *reductaria*, lacking the distal shading to the upper part of the t. p. line on the forewings.

The male genitalia of *mallea* are very similar to those of *elegia*. The present species can be recognized by the position and length of the process of the right valve, as it is situated lateral to the apex of the valve and extends beyond the apex for a distance about equal to the width of the capitate portion of the uncus. In addition, the setose area near the base of the large costal tubercle is but slightly raised and membranous in *mallea*, as compared with the sclerotized, tuberculate shape that is found in *elegia*. The female genitalia of these two species are very different, as *mallea* does not have the type of structure that is found in *mutabilis* and *elegia*. The asymmetrical sinus vaginalis and the tapered lamella postvaginalis are diagnostic for the female genitalia of the present species.

***Melanolophia bugnathos*, new species**

This is a large, pale species with maculation like that of many of the preceding species; the females are similar to the males, although the ground color is slightly different. The species, occurring in the Andean region and in Central America, is divided into three subspecific populations that are separable on both wing and genitalic characters. *Melanolophia bugnathos* can be recognized by the large bilobed uncus and by the very big, deeply bifurcate gnathos in the male, and by the configuration of the asymmetrical sinus vaginalis and surrounding structures in the female.

***Melanolophia bugnathos bugnathos*, new subspecies**

Plate 7, figure 5; text figures 63, 143

This subspecies is the largest one, and it occurs in Bolivia and Peru. The males have wings very much like those of *mallea*, which occurs in the same area.

MALE: Head, thorax, and abdomen like those of *reductaria*, but tending to be more marked with dark scales.

UPPER SURFACE OF WINGS: Forewings with ground color pale grayish brown or pale buff, overlain with ochraceous and dark brown scales; cross lines like those in *mallea*, but with s. t. line tending to be subparallel with outer margin in upper part of wing. Hind wings like those of *mallea*.

UNDER SURFACE OF WINGS: Similar to those of *mallea*.

LENGTH OF FOREWING: 21 to 24 mm.; holotype, 24 mm.

FEMALE: Similar to male, with upper surface more buff in color, and with outer portion of wings tending to be slightly darkened. Under surface more heavily overlain with brown scales, and with a definite subterminal band on all wings.

LENGTH OF FOREWING: 23 to 24 mm.; allotype, 24 mm.

MALE GENITALIA: Uncus evenly tapered from broad base, expanded distally to form lateral lobes separated by small, U- or V-shaped notch; socius represented by about three to five setae; gnathos broad, strongly enlarged medially, produced posteroventrally as two large, rugose projections separated by deep notch; each valve with small tubercle on dorsal surface of costa and tuft of elongate setae; valvula with small anterior section of setose ridge raised, setose on inner side, spinose on outer side; valves with narrow sclerotized strip extending from sacculus at base of valves to outer portion of setose ridge in valvula; processes of valves strongly asymmetrical, one on right side about four times as long as that on left; right process with basal one-third broad, hollow, terminal section gently curving inwardly, with one very large spine and several smaller spines at base, arising from dorsal surface and directed inwardly, and with band of setae extending up dorsal surface to and around apex, curving outwardly at end, process extending to about middle of uncus; left process very short, not attaining length of base of right process, swollen basally, with small piece connected to sclerotized sacculus strip; anellus with weakly sclerotized base, a raised, expanding, median section, widening into rounded apical area; tegumen with parallel sides, saccus elongate, with small median protuberance anteriorly; aedeagus slightly shorter than combined lengths of uncus, tegumen, and saccus, with tapering, sclerotized projection posteriorly, anterior end narrowed, elongate, and with several longitudinal striations on dorsal surface; vesica unarmed. Abdomen with both sets of tufts on A_3 present, outer ones fused together, forming prominent, apically curved protuberance; posterior

double comb consisting of about nine to 12 modified, well-spaced setae medially on each side, laterally with numerous setae very closely spaced.

FEMALE GENITALIA: Sterigma with prominent, asymmetrical, genital plate, slightly more strongly developed on left side than on right, more slender anteriorly and on right side; rim of sinus vaginalis in form of transverse ellipse, thickened, sclerotized; lamella antevaginalis inconspicuous, slightly raised portion of rim, becoming higher on left side and posteriorly, uniting with lamella postvaginalis to form a diagonal, raised, sclerotized ridge posteriorly; ductus bursae extending from right side of sinus vaginalis, sclerotized and rugose, joining corpus bursae ventrally; corpus bursae elongate, lightly sclerotized and rugose around ductus bursae; signum very small.

TYPES: Holotype, male, and allotype, female, Yungas del Palmar, Bolivia, April 10, 1950, elevation 2000 meters. Paratypes: *Bolivia*: Same data as types, September 5, 1948, October 15, 1949, elevation 1000 meters, two males; Yunga del Espiritu Santo, Cochabamba, 1888-1889 (P. Germain), three males, one female; Incachaca, Cochabamba (J. Steinbach), two males; Rio Songo, elevation 750 meters (Fassl), one male; no further data, one male. *Peru*: Coosnipata, Paucartambo, Cuzco, December 3, 1951 (F. L. Woytkowski), one male; Callanga, Paucartambo, Cuzco, February 19, 1953 (F. L. Woytkowski), one male; Oxapampa, [Pasco], elevation 6400 feet, one male, elevation 2000 meters, two males; La Oroya, R[io] Inambari, September, 1904 (dry season), elevation 3100 feet (G. Ockenden), one male; Huancabamba, [Piura], one male; Chanchamayo, [Pasco], one male. The holotype and allotype are in the collection of the American Museum of Natural History; paratypes are in the collections of that institution, of the British Museum (Natural History), and of the United States National Museum. There is also a single male specimen labeled Colombia (Fassl) that belongs here according to the genitalia.

RANGE: Bolivia (the department of Cochabamba) and Peru (the departments of Cuzco, Pasco, and Piura). This subspecies occurs in the mountains at elevations of from about 2500 to 6600 feet, and specimens have been

captured in February, April, September, October, and December.

REMARKS: Twenty-one specimens and 13 genitalic dissections were studied. Members of this subspecific population are very similar to *mallea* and occur in the same area. The present subspecies tends to be slightly grayer in color, and the genitalia are very distinct.

***Melanolophia bugnathos contracta*,
new subspecies**

Plate 7, figure 6; text figure 64

This subspecies is slightly paler and slightly smaller than the preceding population. It occurs in Ecuador. There are also genitalic differences which distinguish the two subspecific populations.

MALE: Head, thorax, and abdomen like those of nominate *bugnathos*.

UPPER SURFACE OF WINGS: Forewings with ground color pale buff, overlain with ochraceous and brownish ochraceous scales; maculation like that of nominate *bugnathos*.

UNDER SURFACE OF WINGS: Similar to those of nominate *bugnathos*, but tending to be more heavily overlain with brown scales, and with subterminal band present.

LENGTH OF FOREWING: 21 to 23 mm.; holotype, 22 mm.

FEMALE: Similar to male, with ground color slightly brighter, and more heavily overlain with brown scales. Under surface with definite subterminal band on all wings.

LENGTH OF FOREWING: 19 to 23 mm.; allotype, 23 mm.

MALE GENITALIA: Similar to nominate subspecies, but with much shorter process of right valve, not attaining posterior margin of anellus, shaped like basal portion of nominate *bugnathos* up to and including heavy spine at anterior portion of terminal section, but entire terminal portion lacking.

FEMALE GENITALIA: Similar to nominate subspecies, but tending to have slightly more asymmetrical sterigma, and with lamella postvaginalis tending to be more pointed.

TYPES: Holotype, male, Balzapamba, Bolivar, Ecuador, September, 1893, to February, 1894 (M. de Mathan); allotype, female, same data, March-April, 1894. Paratypes, all from Ecuador: Same data as holotype, two males, three females; same data as allo-

type, two males, one female; Paramba, [Imbabura], one male; Lita, [Imbabura], elevation 3000 feet (Hemming), one male. The holotype, allotype, and paratypes are in the collection of the British Museum (Natural History).

RANGE: Ecuador (the provinces of Bolivar and Imbabura). The specimens have been taken at elevations of approximately 3000 to 3300 feet; the only information on time of flight is "September to February."

REMARKS: Twelve specimens and six genitalic dissections were studied. This population is smaller and paler than the nominate subspecies. The genitalic differences are outlined above.

***Melanolophia bugnathos elaphra*, new subspecies**

Plate 7, figure 7

Tephrosia bostar DRUCE, 1892 (1891-1900), p. 76 (*partim*).

Six females from Panama and Costa Rica are known. They are lighter and brighter in color than the females of *bugnathos contracta*. Small genitalic differences also are present.

MALE: Unknown.

FEMALE: Head, thorax, and abdomen like those of females of *contracta*.

UPPER SURFACE OF WINGS: Ground color of wings pale buff, heavily overlain with ochraceous scales, and with scattered dark brown scales; maculation like that in females of *contracta*.

UNDER SURFACE OF WINGS: Similar to that of females of *contracta*, or with subterminal band slightly more pronounced.

LENGTH OF FOREWING: 21 to 23 mm.; holotype, 21 mm.

MALE GENITALIA: Unknown.

FEMALE GENITALIA: Similar to *contracta*, but with sterigma having narrower anterior margin, and with lamella postvaginalis terminating in an almost erect protuberance.

TYPES: Holotype, female, El Volcan, Chiriqui, Panama, February 17, 1936 (Gertsch and Lutz). Paratypes: *Panama*: Volcan de Chiriqui, elevation 2000-3000 feet (Champion), one female, identified as "*Tephrosia bostar* Druce, B. C. A. Lep. Het., Godman-Salvin coll." *Costa Rica*: Orosi, elevation 1200 meters (Fassl), one female; Sitio, June, one female; Juan Vinas, June (Schaus and Barnes), one female; Puntarenas,

Monteverde, January 6, 1962, elevation 4600 feet (C. W. Palmer), one female. The holotype is in the collection of the American Museum of Natural History; paratypes are in the collections of that institution, of the British Museum (Natural History), and of the United States National Museum.

RANGE: Panama (the province of Chiriqui) and Costa Rica. The specimens were captured in the mountains at elevations of from about 3300 to 4600 feet; the dates of capture are January, February, and June.

REMARKS: Six specimens and six genitalic preparations were studied. The subspecific characteristics for this population are outlined above.

GROUP VII

The upper surface of the wings of the species in this group is usually pale buff, variably overlain with ochraceous and brown scales. The cross lines are rather weakly represented, with the dentate t. p. and s. t. lines being strongest. There is a great deal of similarity in the general appearance of the species in this group, but the genitalia offer good specific differences. The adults of this group are large, with the length of the forewing ranging from 18 to 24 mm., and the average size of the species being from 20.0 to 23.5 mm.

The male genitalia have either a swollen, usually bifurcate uncus, or a tapering, slender one; the gnathos varies from being broadly swollen with a small median indentation to being deeply bifurcate, or somewhat truncate with a median lobe. The anellus is often strap-like, with posterolateral pieces, or it is weakly constricted medially. The processes of the valves are of approximately equal length in one species. Five species have the right process longer, while in the remaining six species the reverse is true. The lateral hair pencils of the third abdominal segment are fused together terminally in six species (those having a simple uncus), while in the remainder the hair pencils are strongly developed and free (the species having a swollen uncus).

The females of five species are known; those of seven are unknown. The sterigma of the known species is either large and elliptical or of a more membranous nature.

The lamella antevaginalis is weakly developed or not differentiated. The lamella postvaginalis is strongly developed, in three species being an elongate process and in the others a smaller, apical bifurcate process. The ductus bursae is either very short or of moderate length.

The early stages and food plants of all the species in this group are unknown.

Group VII contains 12 species, all occurring in South America with one exception. Two of these occur in southern Brazil, while all the others are found in the Andes Mountains, from western Venezuela and Colombia south to Bolivia. One species is known from Panama and Costa Rica.

Melanolophia spatiosata (Dognin), new combination

Plate 7, figure 8; text figures 65, 144

Cymatophora spatiosata DOGNIN, 1902, p. 479.

This is a large species, with pale buff or slightly yellowish wings heavily overlain with dark brown scales. The t. p. line is strongly dentate, and the s. t. line is complete. The species occurs in Bolivia and Peru.

MALE: Head, vertex with mixed pale buff, brown, and dark brown scales, with dark brown band between bases of antennae; front pale buff, with dark brown bands across top and near bottom; palpi pale buff at base, outer portion of basal segment and distal segments mostly dark grayish brown. Thorax above pale buff or cream-colored, more or less heavily scaled with grayish brown, collar grayish brown or grayish black, tending to become darker apically, patagia grayish brown, with narrow, transverse, dull black band medially; below pale buff; legs pale buff, variably spotted with dark gray and black. Abdomen pale buff above, basal two or three segments with paired, median, dull black spots, all segments with scattered grayish brown scales; paler below.

UPPER SURFACE OF WINGS: Forewings with ground color pale buff or cream-colored, heavily overlain with dark brown spots and striations; cross lines dark brown, outer two heavier than basal ones; t. a. line complete in most specimens, strongly curved outwardly in cells, meeting inner margin closer to thorax than point of origin on costa, the

line weakly geminate in some specimens; median line obsolescent, weakly represented in some examples; discal spot black, small; t. p. line strongly outwardly dentate on veins, particularly in upper part of wing, lower portion of line inwardly oblique, swinging outward to anal vein, very narrowly shaded outwardly with stripe of ground color, then with dark brown scales opposite cell and above anal vein in many specimens; s. t. line complete in most examples, consisting of black cellular spots, narrowly shaded outwardly with ground color, and with spots in cells M_1 and M_2 heavily shaded distally as far as wing margin with dark grayish brown or black; terminal line of black, intravenular spots; fringe concolorous with wing. Hind wings concolorous with forewings; median line weakly represented; discal spot grayish black, small; extradiscal line weak anteriorly, becoming weakly outwardly dentate on veins posteriorly, and more or less shaded outwardly by broad, nebulous, dark band; s. t. and terminal lines, and fringe, like those on forewings.

UNDER SURFACE OF WINGS: Unicolorous pale buff or pale grayish brown, overlain with dull gray or grayish brown spots and striations except along inner margin of forewings; hind wings more evenly overlain with smaller groups of dark scales; discal spots and outer lines weakly reflected from upper surface and with strong, dark, subterminal band on all wings.

LENGTH OF FOREWING: 20 to 24 mm.

FEMALE: Similar to male, but with upper and lower surfaces of wings tending to be slightly more heavily overlain with dark scales.

LENGTH OF FOREWING: 21 to 23 mm.

MALE GENITALIA: Uncus slightly tapering basally, with broadly swollen apical section, terminating in two well-separated points; socius absent; gnathos with very large, rugose, median process, in width equal to width of base of uncus, narrowing distally, terminating in two strong points separated by broad V-shaped notch; each valve with costal tubercle and tuft of elongate setae; valvula without spine patch; valves with narrow, weakly sclerotized strip, in some partially obsolescent, extending from sacculus at base of valves to outer portion of setose ridge in

valvula; processes of valves asymmetrical, one on right side longer than that on left; right process with wide base, extending as arm of even width, slightly tapering distally, apical portion with numerous short setae and some examples with one or two larger setae on inner side near apex, process extending almost to base of gnathos; left process extending to posterior portion of anellus, with basal section as on right side but with much shorter apical piece, the latter with dorsal setae at apical region and some specimens with one or two longer setae on outer side near apex; anellus strap-like, posterolateral margins with flanking sclerotized strips; tegumen with parallel sides, saccus narrowed, with small median protuberance anteriorly; aedeagus subequal in length to combined lengths of uncus, tegumen, and saccus, with tapering, sclerotized projection posteriorly, and with several longitudinal, slightly counterclockwise striations on dorsal surface; vesica unarmed. Abdomen with both sets of tufts on A_3 present, outer ones shorter than inner and arising from large, basal, sack-like protuberance; posterior double comb consisting of about nine or 10 modified, well-spaced setae medially on each side, laterally with numerous setae very closely spaced.

FEMALE GENITALIA: Sterigma with membranous genital plate, sinus vaginalis at base of large depression formed by sterigma and posterior margin of abdominal segment; lamella antevaginalis an irregularly raised, lip-like margin; lamella postvaginalis well sclerotized, elongate, in length about one-third of length of apophyses anteriores, arising from raised dorsal margin, constricted medially, posteriorly bifurcate; ductus bursae longer than lamella postvaginalis, tapering, slightly constricted anteriorly before dorsal junction with corpus bursae; corpus bursae rather short, swollen anteriorly; signum very small.

TYPES: Dognin described *spatiosata* from "several males." The specimen that bears the number U.S.N.M. No. 32977 is hereby designated the lectotype; the male genitalia are mounted on a slide labeled "no. 1344, August 1961, E.L.T."

TYPE LOCALITY: Rio Songo, Bolivia.

RANGE: Bolivia (the departments of Beni, La Paz, and Cochabamba) and southern

Peru (the departments of Cuzco, Puno, Junin, and Pasco). This species occurs in the mountains at lower elevations, ranging from about 2000 to 6500 feet. The adults have been taken in every month of the year except May. (See Appendix for locality data of specimens examined.)

REMARKS: Sixty-four specimens and 15 genitalic dissections were studied. There appears to be some variability in the amount of brown suffusion on the upper surface of the wings, as this varies from being quite heavy to being relatively light.

The genitalia of *spatiosata* are somewhat like those of *mutabilis* and its close allies. The maculation of the adults will quickly separate the two groups of species.

Melanolophia conta, new species

Plate 7, figure 9; text figure 66

This is a large species that is very similar in appearance to *spatiosata*. The coloration of the upper side of the wings tends to be a somewhat paler or more reddish brown than that in the preceding species. The genitalia offer the best means of recognizing this moth. This species occurs in Peru.

MALE: Head, thorax, and abdomen similar to those of *spatiosata*, but tending to have fewer dark brown scales.

UPPER SURFACE OF WINGS: Forewings with ground color pale buff, heavily overlain with ochraceous brown; maculation like that of *spatiosata*.

UNDER SURFACE OF WINGS: Like that of *spatiosata*.

LENGTH OF FOREWING: 23 to 24 (holotype) mm.

FEMALE: Unknown.

MALE GENITALIA: Similar to those of *spatiosata*, differing mainly in the processes of the valves and anellus; processes of valves asymmetrical, one on right side longer than that on left; right process with broad base, extending as arm of even width, apex rounded, ventral and inner surfaces with numerous very small setae, process extending to beyond end of uncus; left process extending to middle of uncus, similar to right arm but with shorter base; anellus somewhat strap-like, with small constriction near base, increasing in width posteriorly, posterolateral margins with adjacent sclerotized strips. Abdomen like that of *spatiosata*, but posterior double comb with

10 or 11 modified, well-spaced setae on each side.

FEMALE GENITALIA: Unknown.

TYPES: Holotype, male, Chanchamayo, [Pasco], Peru (O. Schuncke); paratype, Peru, no further data, one male. The holotype and paratype are in the collection of the British Museum (Natural History).

RANGE: Peru (the department of Pasco).

REMARKS: Two specimens and two genitalic dissections were studied. This species has somewhat paler or more reddish brown color on the upper side of the wings than is found in *spatiosata*. The male genitalia differ from those of the preceding species primarily by the longer processes of the valves.

Melanolophia minca, new species

Plate 7, figure 10; text figure 67

This is another large species that is very similar in appearance to lightly marked specimens of *spatiosata*. The genitalia should be used for identification. The species occurs in Colombia.

MALE: Head, thorax, and abdomen similar to those of *spatiosata*, but tending to have fewer dark brown scales.

UPPER SURFACE OF WINGS: Forewings with ground color pale buff, overlain with ochraceous brown, and with scattered dark brown scales; maculation like that of *spatiosata*, with t. p. line more clearly defined.

UNDER SURFACE OF WINGS: Like that in *spatiosata*, but with subterminal band slightly more weakly represented.

LENGTH OF FOREWING: 22 to 23 mm.; holotype, 23 mm.

FEMALE: Unknown.

MALE GENITALIA: Similar to those of *spatiosata* but more elongate, and differing in the processes of the valves and anellus; processes of valves asymmetrical, one on right side about three times as long as that on left; right process very long and slender, slightly tapering apically to dull point, extending to beyond middle of uncus; left process very short, slender, pointed, extending to just beyond middle of anellus; anellus strap-like, with small constriction near base and with broader constriction distally, posterolateral margins with adjacent sclerotized strips. Abdomen like that in *spatiosata*, but with posterior double comb with 11 or 12 modified, well-spaced setae on each side.

FEMALE GENITALIA: Unknown.

TYPES: Holotype, male, Minca, [Magdalena], Colombia, elevation 2000 feet (H. H. Smith). Paratypes, both from Colombia: Same data as holotype, two males. The holotype and paratypes are in the collection of the British Museum (Natural History).

RANGE: Colombia (the department of Magdalena). The moths were taken at an elevation of 2000 feet.

REMARKS: Three specimens and two genitalic dissections were studied. This species is slightly paler and has a more clearly defined t. p. line than is found in *spatiosata*. The male genitalia can be separated from those of the latter species by the fact that the right process of the valve is about three times as long as the very short left process.

Melanolophia rima, new species

Plate 7, figure 11; text figure 68

This is another large species, almost indistinguishable from *minca* in size, color, and maculation. The genitalia should be used for identification. This species occurs in Colombia and Peru.

MALE: Head, thorax, and abdomen like those of *minca*.

UPPER SURFACE OF WINGS: Like that in *minca*, but with t. p. line tending to have slightly smaller outwardly projecting teeth on veins.

UNDER SURFACE OF WINGS: Like that in *minca*.

LENGTH OF FOREWING: 23 to 24 mm.; holotype, 23 mm.

FEMALE: Unknown.

MALE GENITALIA: Uncus tapered basally, constricted medially, terminal portion swollen, rounded apically with two strong points; socius absent; gnathos with very large, rugose, median process, wider than width of base of uncus, with very deep and wide median division; each valve with costal tubercle and tuft of elongate setae; valvula without spine patch; valves with narrow, weakly sclerotized strip extending from sacculus to setose ridge in valvula; processes of valves asymmetrical, one on right side much longer than that on left; right process with wide base, folded over ventrally from outer side, dorsally narrowed about one-third of distance from base, with large, spinose process arising on distal surface and curving

dorsally under elongate, slender, terminal section of process, apically curved medially with many short, thickly set setae distally, process extending beyond end of uncus; left process extending beyond posterior margin of anellus, broad basal section with postero-medial portion extended as blunt protuberance, with median constriction and simple, slightly curved, apical process; anellus broad, constricted medially, anterolateral areas flattened, enlarged distally, with adjacent posterolateral sclerotized pieces; tegumen with parallel sides, saccus narrowed, broadly U-shaped anteriorly; aedeagus slightly longer than combined lengths of uncus, tegumen, and saccus, with posterior end bluntly pointed; vesica unarmed. Abdomen with both sets of tufts on A_3 present, outer ones shorter than inner and arising from large, sack-like protuberances; posterior double comb consisting of about nine to 11 modified, well-spaced setae medially on each side, laterally with numerous setae very closely spaced.

FEMALE GENITALIA: Unknown.

TYPES: Holotype, male, Muzo, [Santander], Colombia, May, 1915. Paratypes, both from Peru: Oxapampa, [Pasco], elevation 2000 meters, one male; no further data, one male. The holotype and paratypes are in the collection of the United States National Museum.

RANGE: Colombia (the department of Santander) and Peru (the department of Pasco). The few known specimens were taken at moderate elevations, 2500 to 6600 feet, on the eastern side of the Andes Mountains. The only date of capture is May.

REMARKS: Three specimens and two genitalic dissections were studied. As this species is extremely similar to *minca*, the genitalia should be studied. The male structures of the present species can be distinguished from those of the preceding species by the larger and much more deeply divided gnathos, and by the heavier processes of the valves, with the right one having the large, spinose process medially.

Melanolophia eucheria Schaus

Plate 7, figure 12; text figures 69, 145

Melanolophia eucheria SCHAUS, 1927, p. 79.

This species is large and has rather pale-colored wings above. It is similar to *spatiosata*, but the t. p. line tends to be more in-

wardly oblique. The genitalia offer good diagnostic characters. *Melanolophia eucheria* occurs in southern Brazil.

MALE: Head, thorax, and abdomen similar to those of *spatiosata*, but with fewer dark brown scales.

UPPER SURFACE OF WINGS: Forewings with ground color pale buff, lightly overlain with pale ochraceous and with scattered dark brown scales; maculation similar to that of *spatiosata*, but with median shade line represented on costa by dark grayish brown spot, and with t. p. line more inwardly oblique, meeting inner margin about one-half of distance from base, this line shaded distally by broad, weakly defined ochraceous band and by dark brown scales above inner margin. Hind wings like those of *spatiosata*.

UNDER SURFACE OF WINGS: Unicolorous pale buff, lightly overlain with pale grayish brown or brown scales; maculation weakly reflected from upper side in many specimens; subterminal band weak to moderately strong.

LENGTH OF FOREWING: 21 to 23 mm.

FEMALE: Similar to male, but with upper surface of wings more heavily overlain with ochraceous brown scales, and with more dark scaling and a heavier subterminal band below in most specimens.

LENGTH OF FOREWING: 21 to 24 mm.

MALE GENITALIA: Uncus tapered basally, constricted medially, terminal portion slightly enlarged before bifurcate apex, each protuberance with strong point; socius absent; gnathos with very large, rugose, median process, in width equal to width of base of uncus, with very deep and wide median division; each valve with costal tubercle and tuft of elongate setae; valvula without spine patch; valves with narrow, sclerotized strip extending from sacculus to setose ridge in valvula; processes of valves asymmetrical, one on right side longer than that on left; right process with wide base, folded over ventrally from outer side, dorsally narrowed medially, distal portion broad, tapering distally and curving medially, apical region with short dorsal setae, increasing in length terminally, distal portion varying in length, with right process ranging in length from not attaining posterior margin of tegumen to reaching distal part of uncus; left process varying in length from middle to posterior

portion of anellus, with broad basal section, similar to one on right side but shorter, constricted medially, and with short to moderately long simple terminal process; anellus broadly constricted medially, enlarged distally with rounded terminal margin; tegumen with parallel sides, saccus narrowed, rounded or with small median protuberance anteromedially; aedeagus slightly longer than combined lengths of uncus, tegumen, and saccus, with tapering, sclerotized projection posteriorly, and with elongate, tapering, anterior portion; vesica unarmed. Abdomen with both sets of tufts on A_3 present, outer ones shorter than inner and arising from large, basal, sack-like protuberance; posterior double comb consisting of about nine to 11 modified, well-spaced setae medially on each side, laterally with numerous setae very closely spaced.

FEMALE GENITALIA: Sterigma ovoid, widest anteriorly, tending to be bluntly pointed posteriorly, sclerotized around rim of sinus vaginalis; lamella antevaginalis not differentiated; lamella postvaginalis well sclerotized, somewhat variable in shape, square or rectangular in outline, with median indentation posteriorly; ductus bursae extending anteriorly beyond sterigma, becoming wider, rugose, with crenulate ventral surface; corpus bursae rather short and broad; signum very small.

TYPE: Schaus described *eucheria* from a single female specimen (U.S.N.M. No. 33205).

TYPE LOCALITY: Alto da Serra, São Paulo, Brazil.

RANGE: Southern Brazil (the states of Minas Gerais, São Paulo, Rio de Janeiro, Paraná, and Santa Catarina). This species is found in the Humid Subtropical Zone at elevations ranging from about 1000 to 2600 feet. The adults have been captured in March, July, August, September, and December. (See Appendix for locality data of specimens examined.)

REMARKS: Eighteen specimens and eight genitalic dissections were studied. While being similar to *spatiosata*, the present species is paler in color and has a more inwardly oblique t. p. line which is shaded distally by a broad, nebulous, ochraceous band. *Melanolophia eucheria* tends to be paler on the under surfaces than *spatiosata* and to have a

more weakly developed subterminal band.

In the male genitalia, the larger, more deeply cleft gnathos, and the more strongly asymmetrical processes of the valves will serve to separate *eucheria* from *spatiosata*. In the female genitalia, *eucheria* can be recognized by the small, rectangular, posteriorly bifurcate lamella postvaginalis, and by the short ductus bursae, as compared with the elongate, slender lamella postvaginalis and the more elongate ductus bursae of *spatiosata*.

***Melanolophia consimiliaria* (Walker),
new combination**

Plate 7, figure 13; text figures 70, 146

Boarmia consimiliaria WALKER, 1860, p. 363. DRUCE, 1892 (1891-1900), p. 80 (synonym of *Bryoptera infuscaria* Guenée).

Boarmia nebularia SCHAUS, 1897, p. 166. New synonymy.

This species has the appearance of a small and dark *eucheria*, but with the t. p. line not being so oblique. *Melanolophia consimiliaria* is the first of several species in this group to have the outer hair pencils on A_3 fused together to form a prominent, apically curved protuberance. This species is found in southern Brazil.

MALE: Head, thorax, and abdomen similar to those of *spatiosata*.

UPPER SURFACE OF WINGS: Forewings with ground color pale buff, heavily and evenly overlain with ochraceous brown and dark brown scales; cross lines weak or obsolescent, dark brown; t. a. and median lines obsolescent or absent; discal spot blackish brown, small; t. p. line weakly represented, outwardly dentate on veins, tending to be obsolescent in center of wing; s. t. line equally spaced between apex and t. p. line or very slightly nearer to wing margin, of blackish brown spots in upper portion of wing, obsolescent below, spot in cell R_5 with distal shading of white in some specimens, spots in cells M_1 and M_2 usually with nebulous, dark brown, distal shading; fringe concolorous with wing, slightly lighter opposite veins. Hind wings concolorous with forewings; median line shaded distally by broad dark brown or brownish gray band, obsolete in upper portion of wing; extradiscal line slightly dentate, shaded distally by brown band, followed by slightly narrower, rather nebulous band of

ground color; s. t. line represented in lower portion of wing by blackish brown spots; subterminal and terminal areas brown; fringe like that on forewings.

UNDER SURFACE OF WINGS: Forewings pale grayish brown, sprinkled with pale brown scales except along paler inner margin; hind wings slightly paler; discal spots blackish brown, small; s. t. line represented in upper part of primaries and on secondaries; otherwise without maculation or very faint indications of other cross lines.

LENGTH OF FOREWING: 18 to 21 mm.

FEMALE: Similar to male, but with body and wings tending to be slightly more heavily dusted with dark brown scales. Under surface like that in male, or with maculation slightly better defined.

LENGTH OF FOREWING: 18 to 23 mm.

MALE GENITALIA: Uncus tapering from broad base, sides slightly concave, terminal portion sharply bent ventrally and terminating in single point; socius represented by about 10 to 15 setae; gnathos enlarged medially, sharply curving and produced posteriorly, with long central lobe and smaller, lateral, shoulder-like projections, rugose on dorsal surface, concave below; each valve with costal tubercle and tuft of elongate setae; valvula without spine patch; processes of valves asymmetrical, one on right side slightly longer than that on left; right process with broad, concave, weakly sclerotized base extending for slightly more than one-half of length, terminal portion flattened, more heavily sclerotized, with rounded apex and having one large, very heavy spine curving outwardly, with numerous smaller setae on inner surface arising from ventral margin of terminal portion, rarely without terminal spines, the process extending beyond posterior portion of anellus; left process similar to right one but with shorter base, terminal portion almost as long as base, flattened ventrally and with swollen ridge dorsally along inner margin of terminal portion, this ridge with numerous setae arising from outer surface anteriorly and curving inwardly posteriorly, terminating in very large, heavy, outwardly curved spine distally; anellus with large subrectangular base, with slightly raised median portion of equal width, and slightly widened, curving terminal portion; tegumen

of even width, with prominent posterolateral angles, saccus U-shaped; aedeagus slightly shorter than combined lengths of uncus, tegumen, and saccus, with tapering, sclerotized projection posteriorly and narrowed anterior end, with several longitudinal striations on dorsal surface; vesica unarmed. Abdomen with both sets of tufts on A_3 present, outer ones fused together, forming prominent, apically curved protuberance; posterior double comb consisting of about 11 to 14 modified, well-spaced setae medially on each side, laterally with numerous closely spaced setae.

FEMALE GENITALIA: Sterigma with genital plate largely membranous, lightly sclerotized anteriorly and anterolaterally, extending much farther posteriorly and laterally than anteriorly, with anterior margin indented medially, lateral and posterior margins rounded; lamella antevaginalis small, scarcely differentiated from rim of sinus vaginalis; lamella postvaginalis well sclerotized, elongate, longer than length of sinus vaginalis, slightly constricted above base in most specimens, posterior margin indented medially; ductus bursae short, membranous posteriorly, lightly sclerotized and rugose anterior to median constriction, joining corpus bursae dorsally; corpus bursae rather short, widened anteriorly; signum small.

TYPES: Walker described *consimilaria* from a single female specimen; it is now in the University Museum at Oxford, England. The type of *nebularia* Schaus is a female (U.S.N.M. No. 12502).

TYPE LOCALITIES: "Rio Janeiro," Brazil (*consimilaria*); Petropolis, Brazil (*nebularia*).

RANGE: Southern Brazil (the states of Espírito Santo, Minas Gerais, São Paulo, Rio de Janeiro, Paraná, Santa Catarina, and Rio Grande do Sul). *Melanolophia consimilaria* is found in the Humid Subtropical Zone at moderate elevations, as it occurs from near sea level to about 2800 feet. Specimens have been examined that were captured in every month of the year except September and November. (See Appendix for locality data of specimens examined.)

REMARKS: Thirty-eight specimens and 19 genitalic dissections were studied. The upper surface of the wings of *consimilaria* is darker than that of any of the preceding species in

this group, the maculation is more weakly defined, and the moth is smaller.

This species is the first one of this group to have the lateral hair pencils of A_3 fused together. The gnathos is distinctive in having the strong central lobe with lateral, shoulder-like projections, and the processes of the valves are different from those of the preceding species. In the female genitalia the strongly developed lamella postvaginalis will separate *consimilaria* from any of the previous species.

The male genitalia of three specimens have the process of the right valve without any terminal spination of any kind. In other respects the remainder of the genitalia, and the moth itself, agree very well with normal specimens, so they are included here.

***Melanolophia immarcata* (Schaus),
new combination**

Plate 7, figure 14; text figure 71

Tephrosia immarcata SCHAUS, "1900" [1901b], p. 248.

This species appears similar to *eucheria*, but the wings are more heavily dusted with dark scales and the t. p. line is not so oblique as in the Brazilian species. The maculation is like that of *consimilaria*, but the present species is paler and has stronger dashes in the terminal area of the forewing opposite the cell. The genitalia of the present species are distinctive. *Melanolophia immarcata* occurs in Bolivia and Peru.

MALE: Head, thorax, and abdomen similar to those of *spatiosata*.

UPPER SURFACE OF WINGS: Forewings with ground color pale buff, lightly overlain with dark brown scales; cross lines weak or obsolescent, as in *consimilaria*; t. p. line tending to have small amounts of dark outward shading opposite cell and above inner margin; terminal area with two elongate, blackish brown, cellular dashes, one each in cells M_2 and M_3 . Hind wings concolorous with forewings; pattern like that of *consimilaria*, but with extradiscal line tending to be geminate.

UNDER SURFACE OF WINGS: Forewings pale buff, sprinkled with pale brown scales except along paler inner margin; hind wings concolorous with forewings, tending to have fewer pale brown scales; discal spots dark

brown; s. t. line weakly represented on all wings, becoming obsolescent in lower part of primaries and on secondaries, with line enlarged distally opposite cell; otherwise without maculation.

LENGTH OF FOREWING: 20 to 22 mm.

FEMALE: Unknown.

MALE GENITALIA: Similar to those of *consimilaria*, differing mainly in the processes of the valves; processes of valves asymmetrical, one on left side longer than that on right; right process a slender, raised strip of even width, thickened at junction with face of valve at two-thirds of distance from base, apex bluntly rounded, the process not attaining posterior margin of tegumen; left process extending beyond posterior margin of tegumen, similar to right process basally, with enlarged terminal section thickly set on dorsal surface with inwardly curving setae, apical portion about one-third of width of valve in thickness.

FEMALE GENITALIA: Unknown.

TYPES: Schaus gave no indication in his original description of how many specimens he had when describing *immarcata*. There must have been at least two, as both Peru and Brazil are mentioned in the description. The specimen from Peru that is numbered U.S.N.M. No. 12503 is hereby designated the lectotype; the male genitalia are on a slide labeled "August 1961 E.L.T. 1363." The Brazilian cotype has not been studied, and it is not known whether or not it is conspecific with the lectotype.

TYPE LOCALITY: Peru.

RANGE: Peru and Bolivia (the department of Cochabamba). The single specimen with adequate locality data was taken on the eastern slope of the Andes Mountains in Bolivia, presumably at elevations between 3300 and 4900 feet. The time of flight is unknown. (See Appendix for locality data of specimens examined.)

REMARKS: Two specimens and two genitalic dissections were studied. The Bolivian specimen is more worn than is the lectotype, but the maculation and the genitalia of these two specimens agree quite well. *Melanolophia immaricata* can be distinguished from *consimilaria* by the longer, apically spinose process of the left valve in the male genitalia.

This is the first of three closely related

populations occurring from south to north in the Andean region. It may be that they represent three somewhat varying, subspecific populations of a single species. However, until more material becomes available, it is thought best to regard them as separate species. Females are particularly needed for study, as this sex is not known for *immarcata* and the following species.

***Melanolophia semaricata*, new species**

Plate 7, figure 15; text figure 72

This species is very similar to *immarcata*, but it is slightly darker in color, and some of the specimens tend to be a bit smaller. On the under surface, the subterminal band is more strongly represented in *semarcata* than in *immarcata*. While the genitalia of these two species are similar, specific differences are present. This species occurs in Peru.

MALE: Head, thorax, and abdomen similar to those of *spatiosata*.

UPPER SURFACE OF WINGS: Forewings with ground color pale buff, overlain with pale ochraceous scales and sprinkled with dark brown scales; cross lines weak or obsolescent, like those of *immarcata*; terminal area with blackish brown spot in cells M_2 and M_3 , extending from enlarged spots of s. t. line. Hind wings concolorous with forewings; pattern like that of *consimilaria*.

UNDER SURFACE OF WINGS: Forewings pale buff, variably sprinkled with pale brown scales except along paler inner margin; hind wings concolorous with forewings, tending to have fewer pale brown scales; discal spots dark brown, small; s. t. line represented on all wings, wider on upper part of forewings and enlarged distally opposite cell; t. p. and extradiscal lines weakly represented.

LENGTH OF FOREWING: 18 to 22 mm.; holotype, 22 mm.

FEMALE: Unknown.

MALE GENITALIA: Similar to those of *immarcata*; gnathos swollen medially, tending to be more or less truncate apically, with small median lobe; processes of valves asymmetrical, one on left side longer than that on right; right process a slender, raised strip of even width, apex bluntly pointed, extending almost as far as posterior margin of tegumen; left process extending to apex of uncus, slender, similar to right process but

longer, with small median indentation, outer portion of process distal to median indentation with band of heavy setae curving dorsad under terminal portion, the setae extending posteromedially beyond apex, apical portion about one-fifth of width of valve in thickness.

FEMALE GENITALIA: Unknown.

TYPES: Holotype, male, La Merced, [Pasco], Peru, September 9, 1951 (Rivas). Paratypes, all from Peru: Same data as holotype, February, 1951, September 10, 1951 (Rivas), two males; Chanchamayo, [Pasco], six males, 1892, 1898 (O. Schuncke), seven males; Pozuzu, Huánuco, April, 1906, elevation 800 meters (Sedlmayr), three males; no further data, four males. The holotype is in the collection of the American Museum of Natural History; paratypes are in the collections of that institution, of the British Museum (Natural History), and of the United States National Museum.

RANGE: Central Peru (the departments of Pasco and Huánuco). This species is apparently found at rather low elevations, from 2600 to 3300 feet, on the eastern side of the Andes. The months of capture include February, April, and September.

REMARKS: Twenty-three specimens and 10 genitalic dissections were studied. This species is closely related to *immarcata* but can be distinguished from it by genitalic characters.

Melanolophia agnataria (Snellen),
new combination

Plate 7, figure 16; text figures 73, 147

Boarmia agnataria SNELLEN, 1874, p. 38, pl. 3, fig. 2.

This species is similar to the two preceding ones; it can be separated from them by genitalic characters. It occurs in Colombia and Venezuela.

MALE: Head, thorax, and abdomen similar to those of *spatiosata*.

UPPER SURFACE OF WINGS: Forewings with ground color pale buff, overlain with pale ochraceous scales and sprinkled with dark brown scales; cross lines weak or obsolescent, like those of *immarcata*; terminal area with small blackish brown spots in cells M_2 and M_3 , extending from slightly enlarged spots of s. t. line. Hind wings concolorous with forewings; pattern like that of *consimilaria*.

UNDER SURFACE OF WINGS: Forewings pale buff, lightly sprinkled with brown scales except along paler inner margin; hind wings concolorous with forewings, tending to have fewer brown scales; discal spots dark brown, small; s. t. line present in upper portion of forewings, becoming obsolescent below that and on secondaries; other cross lines absent or weakly represented.

LENGTH OF FOREWING: 18 to 23 mm.

FEMALE: Similar to male but with upper surface of wings more heavily overlain with dark brown scales, and with cross lines tending to be slightly more clearly indicated. Under surface more heavily overlain with brown scales, and with s. t. line more strongly represented.

LENGTH OF FOREWING: 19 to 21 mm.

MALE GENITALIA: Similar to those of *immarcata*, differing mainly in the processes of the valves; processes asymmetrical, one on left side longer than that on right; right process with broad base, outer edge a raised, narrow strip, extending short distance beyond base, apex bluntly pointed or truncate, extending to outer portion of anellus; left process variable in length, varying from posterior margin of anellus to outer portion of uncus, similar to right process basally, extending posteriorly as broad arm, tapering from median constriction, with band of setae arising on outer surface and curving dorsally, the setae extending posteromedially from arm.

FEMALE GENITALIA: Sterigma with large genital plate, very narrow anterior to sinus vaginalis, expanded posterolaterally into wide, slightly concave areas, with median area posterior to sinus vaginalis tending to be slightly raised and more membranous; lamella antevaginalis not differentiated; lamella postvaginalis well sclerotized, elongate, twice as long as length of sinus vaginalis in most specimens, rarely shorter, tapering, posterior margin weakly indented medially; ductus bursae short, membranous posteriorly, becoming lightly sclerotized and rugose when joining corpus bursae dorsally; corpus bursae slightly enlarged anteriorly; signum small.

TYPE: Snellen described this species from two specimens, one with a wing spread of 38 mm. and the other with one of 42 mm. The former specimen is a male and is the one

illustrated with the original description; it is hereby designated as the lectotype. Both specimens are in the Rijksmuseum van Natuurlijke Historie, Leiden.

TYPE LOCALITY: "Cundai, New Grenada." This locality is near Pandi, Cundinamarca, Colombia.

RANGE: Colombia (the departments of Tolima, Antioquia, Cundinamarca, Santander, Norte de Santander, and Magdalena) and western Venezuela (the state of Merida). This species occurs in the foothills and mountainous areas at elevations ranging from about 2000 to 8500 feet. The adults have been captured in January, April, June, September, and December. (See Appendix for locality data of specimens examined.)

REMARKS: Twenty-six specimens and 22 genitalic dissections were studied, including the genitalia of the lectotype. This species is closely allied to the preceding two species, but can be distinguished from them by genitalic characters and distribution. It also appears very similar to *sadrina conara*, which also occurs in Colombia. The present species is larger, slightly lighter in color, and lacks the broad antemedian band of the other species. The genitalia of the two species are quite distinct.

Melanolophia muscosa (W. Warren),
new combination

Plate 7, figure 17; text figure 74

Cymatophora muscosa W. WARREN, 1904, p. 108.

This species is similar to *agnataria* in color and maculation, although it is smaller and darker. The genitalia offer good characters by which to separate the two. The present species occurs in Ecuador and Peru.

MALE: Head, thorax, and abdomen similar to those of *spatiosata*.

UPPER SURFACE OF WINGS: Forewings with ground color pale buff, heavily overlain with pale ochraceous and brown scales; cross lines weak or obsolescent, like those of *immarcata*; terminal area with small blackish brown spots in cells M_2 and M_3 , extending from more strongly represented spots of s. t. line. Hind wings concolorous with forewings; pattern like that of *consimilaria*.

UNDER SURFACE OF WINGS: Forewings pale buff, sprinkled with pale grayish brown

scales except along paler inner margin; hind wings concolorous with forewings, tending to have fewer grayish brown scales; discal spots dark brown, small; s. t. line complete, moderately broad, becoming narrower posteriorly; other cross lines absent or weakly represented.

LENGTH OF FOREWING: 20 to 21 mm.

FEMALE: Unknown.

MALE GENITALIA: Similar to those of *immarcata*, differing mainly in the processes of the valves and anellus; processes of valves strongly asymmetrical, with left one about two and one-half times longer than right one; right process a raised, narrow strip, slightly indented dorsally near middle, apex bluntly pointed, extending to posterior margin of anellus; left process extending to end of valve, or slightly beyond, as free arm, slender, of even width, very weakly S-shaped, apical region with dorsal patch of short setae extending beyond apex, shaft of arm with narrow rugose band posteriorly; anellus increasing in width distally, each side with posterolateral pieces.

FEMALE GENITALIA: Unknown.

TYPE: The unique type is in the collection of the British Museum (Natural History). This specimen is a male, although the original description said it was a female.

TYPE LOCALITY: Ecuador.

RANGE: Ecuador (the province of Loja) and Peru. (See Appendix for locality data of specimens examined.)

REMARKS: Two specimens and two genitalic dissections were studied, plus a painting of the type and a photograph of its genitalia. This small, dark population can be recognized by the very long and slender process of the left valve.

Melanolophia paraconara, new species

Plate 8, figure 1; text figure 75

This is another large species, very similar in color and maculation to *agnataria*, but tending to be slightly larger and paler. The male genitalia offer good specific characters. This species occurs in Colombia.

MALE: Head, thorax, and abdomen similar to those of *agnataria*.

UPPER SURFACE OF WINGS: Forewings with ground color pale buff, overlain with

pale ochraceous scales and sprinkled with brown scales; cross lines weak or obsolescent, like those of *agnataria*; terminal area with small blackish brown or dark brown spots in cells M_2 and M_3 , extending from slightly enlarged spots of s. t. line. Hind wings concolorous with forewings; pattern like that of *agnataria*.

UNDER SURFACE OF WINGS: Forewings pale buff, lightly sprinkled with grayish brown scales except along paler inner margin; hind wings concolorous with forewings, tending to have fewer brown scales; discal spots blackish brown, small; s. t. line represented in upper part of forewings, enlarged opposite cell, becoming reduced or obsolescent below that and on secondaries; other cross lines absent or weakly indicated.

LENGTH OF FOREWING: 21 to 24 mm.; holotype, 22 mm.

FEMALE: Unknown.

MALE GENITALIA: Similar to those of *muscosa*, differing mainly in process of left valve, an elongate, free arm, longer than valve, slightly tapering, slender, sharply curved apically, with thick dorsal patch of short setae extending beyond apex, shaft of arm with narrow rugose band for entire length.

FEMALE GENITALIA: Unknown.

TYPES: Holotype, male, Popayan, [Caqueta, Colombia] (Lehmann). Paratypes, all from Colombia: Same data as holotype, 15 males; El Congo, June, 1907, one male; no further data, 12 males. The holotype is in the collection of the British Museum (Natural History); paratypes are in the collections of that institution and of the American Museum of Natural History.

RANGE: Colombia (the department of Caqueta). Many of the type specimens were captured at an elevation of 4500 feet; the only known month of capture is June.

REMARKS: Twenty-nine specimens and seven genitalic dissections were studied. In color and maculation, *paraconara* is very close to *agnataria*; however, the present species is larger and paler.

Genitally, this species is most closely related to *muscosa*. The present species can be recognized by the more elongate and apically bent process of the left valve.

***Melanolophia orthoconara*, new species**

Plate 8, figure 2; text figures 76, 148

This is a smaller species that occurs in Costa Rica and Panama. It is very similar to *paraconara*, but genitalic differences are present to separate the two species.

MALE: Head, thorax, and abdomen similar to those of *agnataria*.

UPPER SURFACE OF WINGS: Forewings with ground color pale buff, overlain with pale ochraceous scales and sprinkled with brown scales; cross lines weak or obsolescent, like those of *agnataria*; terminal area with small brownish black spots in cells M_2 and M_3 , extending from enlarged spots of s. t. line. Hind wings concolorous with forewings; pattern like that of *agnataria* but with extra-discal line more strongly dentate.

UNDER SURFACE OF WINGS: Forewings pale buff, lightly sprinkled with grayish brown scales except along paler inner margin; hind wings concolorous with forewings; discal spots dark grayish brown, small; s. t. line partially represented on all wings, enlarged opposite cell of forewings; other cross lines absent or weakly indicated.

LENGTH OF FOREWING: 20 mm. (holotype).

FEMALE: Similar to male, but with upper surface of all wings more heavily overlain with ochraceous scales.

LENGTH OF FOREWING: 20 to 21 (allotype) mm.

MALE GENITALIA: Similar to those of *paraconara*, differing mainly as follows: gnathos enlarged medially into subrectangular swelling with broad, rounded, ventro-posterior projection; process of left valve elongate, extending beyond end of valve, straight except for very weak basal and terminal bends, bluntly pointed apically, and with narrow, rugose band of short setae extending full length of arm.

FEMALE GENITALIA: Sterigma membranous, sinus vaginalis at base of large, cup-like depression formed by sterigma and posterior margin of abdominal segment; lamella antevaginalis absent; lamella postvaginalis elongate, sclerotized, tapering, in length two-thirds to three-fourths of length of apophyses anteriores, base broad, concave, apex shal-

lowly bifurcate; ductus bursae elongate, membranous, joining corpus bursae dorsally; corpus bursae relatively short and broad, enlarged anteriorly; signum small.

TYPES: Holotype, male, Lino, [Chiriqui], Panama, elevation 800 meters (Fassl); allotype, female, Juan Vinas, Costa Rica, January (Schaus and Barnes). Paratype: Costa Rica: Orosi, elevation 1200 meters (Fassl), one female. The holotype and allotype are in the collection of the United States National Museum; the paratype is in the collection of the British Museum (Natural History).

RANGE: Western Panama (the province of Chiriqui) and Costa Rica. The type specimens were captured from about 2600 to 4000 feet in elevation; the only time of flight is January.

REMARKS: Three specimens and three genitalic dissections were studied. This species is very similar to the preceding ones, but it is slightly smaller and has a more dentate extradiscal line on the upper surface of the secondaries.

The male genitalia indicate a close relationship to *paraconara* and *muscosa*. The present species can be distinguished from the former by the straight process of the left valve, and from the latter by the extension of the process of the valve beyond the end of the valve. The female genitalia are similar to those of *mutabilis* and allies in group VI. The present species has a broader depression for the sinus vaginalis and a longer ductus bursae than are to be found in *mutabilis*.

GENUS *PHEROTESIA* SCHAUS

Pherotesia SCHAUS, "1900" [1901b], p. 246.

Similar in most characters to *Melanolophia*, differing mainly as follows: Female antennae simple or shortly pectinate. Under side of hind wings of male with or without raised scent patch distally on vein Cu₂, with veins M₂ and M₃ strong, stalked or separate, and with m+ldc of both sexes sharply angled. Abdomen of male with double hair pencil laterally on posterior portion of third segment, rarely absent, outer pair arising from basal sack-like protuberance; large double comb between seventh and eighth segments.

MALE GENITALIA: Uncus thin and taper-

ing, rarely moderately broad; gnathos enlarged medially, rounded or terminating in single point; valves with small costal tubercle, costal swelling or without either, processes or ornamentation symmetrical, some species with raised spine patch in valvula; aedeagus simple or with sclerotized process posteriorly; vesica with one elongate, heavily sclerotized cornutus, several smaller cornuti, or unarmed.

FEMALE GENITALIA: Sterigma with genital plate of large lateral plates, reduced or absent in some species, with lamella antevaginalis and lamella postvaginalis not differentiated; ductus seminalis arising from posterior portion of elongate, membranous, or partially sclerotized corpus bursae; signum absent.

The maculation is of two types, corresponding to the two groups into which the genus is divided. The first is a reticulate pattern of dark brown on a whitish gray base, with less pattern on the hind wings and a strong subterminal band. The second group has the upper surface of the forewings brownish or yellowish brown, with the U- or V-shaped median area slightly lighter in color, and with the hind wings immaculate or with a subterminal band.

EARLY STAGES: Unknown.

TYPE SPECIES: *Pherotesia malinaria* Schaus, the single included species.

RANGE: Mexico, Central America, and South America. In the last area the species are to be found in the Andean Region and the Humid Subtropical Zone of the southeastern portion.

The 19 species of *Pherotesia* are quite similar to those of *Melanolophia* in most respects. A raised scent patch is present on vein Cu₂ on the under surface of the hind wings of the males of certain species; this character is represented in about one-half of the species in the present genus. The adults of *Pherotesia* lack the continuation of the pattern of the forewings onto the upper surface of the secondaries that is present in *Melanolophia*.

The valves and their ornamentation of the male genitalia of *Pherotesia* are symmetrical. Nine species of *Melanolophia* have symmetrical ornamentation of the valves. All these have prominent processes and an unarmed vesica, and most of the species have a

strongly bilobed gnathos, with the others being variously rounded or lobate. In *Pherotesia* the valves may or may not have prominent processes, the vesica is nearly always armed with one or more cornuti, and the gnathos is not bilobed.

In the female genitalia of *Pherotesia*, the lamella antevaginalis and the lamella postvaginalis are not differentiated, while in many species of *Melanolophia* one or the other, or both, are strongly developed. Several species of *Pherotesia* have large lateral plates in the sterigma, a condition not found in *Melanolophia*. Nearly all the species of the latter genus have a small signum, but this feature is absent in *Pherotesia*.

The genus *Pherotesia* is divided into two groups, based primarily on the venation of the secondaries in the males. In group I, veins M_2 and M_3 of the males are stalked, while in group II these veins are separate.

KEY TO SPECIES

BASED ON MALE GENITALIA¹

1. Anellus with posterolateral angles very long and attenuated 2
Anellus with posterolateral angles not enlarged. 4
- 2(1). Forks of anellus extending beyond apex of uncus. *bifurca*
Forks of anellus not extending beyond middle of uncus 3
- 3(2). Spine in vesica with enlarged, striate base *caeca*
Spine in vesica with base not enlarged, of same width as rest of spine *alterata*
- 4(1). Anellus extended posteriorly as sclerotized, pointed, slender arm, extending beyond middle of uncus. *liciata*
Anellus unmodified, membranous. 5
- 5(4). Gnathos small, lobate; vesica armed with rugose and spinose band almost as long as aedeagus *lima*
Gnathos heavily sclerotized, elongate; vesica not as above. 6
- 6(5). Valves with narrow sclerotized strip and raised spine patch 7
Valves without these characters 9
- 7(6). Vesica armed with elongate, slender, sclerotized spine; cristae with setae of same size. 8
Vesica sclerotized, without well-defined spine; cristae with one very heavy seta

and several slender setae on each side *simulatrix*

- 8(7). Cristae of from three to eight setae on each side *condensaria*
Cristae of between 15 and 30 setae on each side. *confusaria*
- 9(6). Aedeagus with terminal sclerotization; vesica armed with one or more spines 10
Aedeagus unarmed, or with a single, elongate spine 17
- 10(9). Gnathos short, apex bluntly wedge shaped *gaviota*
Gnathos large, elongate, digitate, usually with punctate surface. 11
- 11(10). Valves with heavily sclerotized, setose, C-shaped process in basal portion *subjecta*
Valves without such a process 12
- 12(11). Gnathos one-third to one-half of combined lengths of uncus, tegumen, and saccus. 13
Gnathos not more than one-fourth of combined lengths of uncus, tegumen, and saccus. 15
- 13(12). Gnathos one-half of combined lengths of uncus, tegumen, and saccus; terminal one-third of uncus slender, with parallel sides *supplanaria*
Gnathos one-third of combined lengths of uncus, tegumen, and saccus; uncus broad, evenly tapering to well-rounded apex 14
- 14(13). Gnathos tapering to slender point, with apex much more slender than apex of uncus *hamata*
Gnathos broad, apex broadly rounded, as wide as, or slightly wider than, apex of uncus. *falcis*
- 15(12). Processes of valves capitate distally, with row of elongate setae around edge *subsimilis*
Processes of valves non-capitate distally 16
- 16(15). Processes of valves of equal width *lunata*
Processes of valves with both ends tapered *ultrasimilis*
- 17(9). Aedeagus unarmed *potens*
Aedeagus armed with single, large, weakly sclerotized spine *malinaria*

BASED ON FEMALE GENITALIA²

1. Sterigma with sclerotized lateral or circular plates 2
Sterigma without sclerotized plates 10

¹ The male genitalia of *funnebris* are unknown.

² The female genitalia of *bifurca*, *falcis*, *liciata*, *lunata*, and *simulatrix* are unknown.

- 2(1). Lateral plates of sterigma large, subtriangular or oval, lying on each side of mid-line. 3
Sterigma with circular sclerotized area around sinus vaginalis. *alterata*
- 3(2). Lateral plates small, smoothly sclerotized; posterior one-fourth of corpus bursae heavily sclerotized and punctate *funebria*
Lateral plates large; corpus bursae evenly sclerotized. 4
- 4(3). Lateral plates smoothly sclerotized 5
Lateral plates rugose 7
- 5(4). Lateral plates thickly set with short setae; ductus seminalis arising medially from corpus bursae *potens*
Lateral plates without setae; ductus seminalis arising posteriorly from corpus bursae 6
- 6(5). Posterior margin of lateral plates tending to be truncate, with posteromedial portion convex and curving ventrally; ductus bursae arising from near posterior margin of sterigma *gaviota*
Posterior margin of lateral plates tending to be rounded, with posteromedial portion concave; ductus bursae arising from nearer middle of sterigma. *lima*
- 7(4). Slender, smoothly sclerotized longitudinal strip on mid-line between weakly sclerotized lateral plates. *malinaria*
Mid-line without smoothly sclerotized strip 8
- 8(7). Lateral plates of sterigma with only three or four ridges *subjecta*
Lateral plates heavily rugose. 9
- 9(8). Outer margins of sterigma tending to be U-shaped, with area posterior to sinus vaginalis membranous, smooth *ultrasimilis*
Outer margins of sterigma tending to be V-shaped, with area posterior to sinus vaginalis lightly sclerotized, with several concentric ovate ridges *subsimilis*
- 10(1). Ductus bursae short, broad, the length subequal to the width, heavily sclerotized 11
Ductus bursae narrow, elongate, approximately three times longer than wide, lightly sclerotized. 13
- 11(10). Large caecum on right side of corpus bursae posteriorly *caeca*
Corpus bursae without caecum. 12
- 12(11). Ductus bursae widest posteriorly, gently tapering anteriorly, symmetrical *supplanaria*
Ductus bursae with sides subparallel, widest anteriorly, asymmetrical, flaring

- out on right side to join corpus bursae *hamata*
- 13(10). Ductus seminalis arising from lobe of corpus bursae *condensaria*
Ductus bursae arising from small swelling of corpus bursae *confusata*

GROUP I

The species are very similar in appearance, as the upper surface of the wings is whitish gray, heavily overlain with the dark brown pattern. The latter consists of complete, dentate or irregular cross lines on the forewings and a strong s. t. band on the more nearly immaculate hind wings. Because of the similarity in maculation among the species, the genitalia should be studied. In the hind wings of the males there are nine veins, with veins M_2 and M_3 stalked; three of the species do not have a raised scent patch on vein Cu_2 below, but this character is present in two species. The females have eight veins in the hind wings. The moths included in this group are large, with the length of the forewing ranging from 20 to 27 mm. and the average size of the species 22 to 26 mm.

The male genitalia have a broad gnathos, rounded or bluntly pointed distally. The ornamentation of the valves is modest, varying from a simple sclerotized strip and a spine apically, to a broad sclerotized band, spinose apically, to a more complex type with two arms. The anellus is either very weakly sclerotized, with the cristae as one or more long setae laterally near the base on each side, or it is heavily sclerotized, very long, and slender. The aedeagus is simple, either with an elongate spine in the vesica or unarmed. The lateral hair pencils on A_3 are usually present; in one species they are lacking.

The female genitalia have either a membranous and simple sterigma or a broadly sclerotized one. The ductus bursae is short or very small. The corpus bursae is large and curved; in two species it is corneous on one side. The ductus seminalis arises either dorsally or ventrally from the corpus bursae.

Five species are included in group I. They all occur in South America, with one extending into Central America. Two of them are found in Brazil, while the other three are known from the Andes Mountains, with one appearing again in Costa Rica.

***Pherotesia condensaria* (Guenée),
new combination**

Plate 8, figure 3; text figures 77, 155

Boarmia condensaria GUENÉE, 1857, p. 245.
BOISDUVAL AND GUENÉE, 1858, pl. 6, fig. 10.
WALKER, 1860, p. 353. OBERTHÜR, 1913, fasc. 7,
p. 271.

Tephrosia condensaria: DRUCE, 1892 (1891-1900), p. 77 (*partim*).

Pherotesia condensaria is a moderate-sized species with rather uniformly colored wings. The males do not have a raised scent patch on vein Cu_2 below. The genitalia can be used for determination. This species occurs in southeastern Brazil.

MALE: Head, vertex with mixed pale buff and olivaceous brown scales; front dark olivaceous gray, paler below; palpi with mixed buff and olivaceous gray scales, some specimens with scattered black scales. Thorax pale buff above; collar olivaceous gray, with scattered buff scales; patagia with mixed olivaceous gray and pale buff scales; below pale buff; legs pale buff, variably marked with black scales. Abdomen pale buff above, with numerous grayish brown and olivaceous gray scales, posterior margins of segments tending to be pale buff; below pale buff, with much less dark scaling.

UPPER SURFACE OF WINGS: Forewings with ground color pale buff or ochraceous buff, heavily overlain with olivaceous gray and black scales; cubital vein tending to be shaded with olivaceous scaling; cross lines present, usually broadly shaded with dark scales, with patches of ground color between; basal line represented by broad shading near base of wing; t. a. line convex in cell and below cubital vein, tending to be geminate; median line single, extending more or less straight across wing, meeting t. p. line above inner margin in some specimens; discal spot black, elongate, straight or angled; t. p. line geminate, weakly S-shaped, concave between veins; s. t. line complete, of black or olivaceous black, geminate spots; terminal area heavily suffused with dark scaling; terminal line of large, black spots; fringe concolorous with wing, of ground color opposite veins. Hind wings concolorous with forewings, with much less dark scaling than on forewings except for broad terminal area; median line obsolescent; discal spot nebulous, weakly

represented; extradiscal line present in lower part of wing only; s. t. line complete, of grayish black spots; terminal line and fringe like those on forewings.

UNDER SURFACE OF WINGS: Forewings pale buff, variably overlain with dull grayish black scales, more or less concentrated along cubital veins; hind wings less heavily overlain with dark scales, tending to be grouped together in smaller spots; without scent patch; maculation obsolescent except for dark discal spots and for broad s. t. band on all wings.

LENGTH OF FOREWING: 20 to 23 mm.

FEMALE: Similar to male, but with upper surface of forewings more heavily overlain with dark ochraceous brown and with brownish on white ground color, with t. p. and s. t. lines very broad and prominent; secondaries similar to those of male but tending to be more heavily suffused. Under surface with more prominent discal spots and very broad, blackish brown s. t. band, with white spot at apex of wing.

LENGTH OF FOREWING: 21 to 24 mm.

MALE GENITALIA: Uncus tapering, terminating in single point; socius absent; gnathos swollen medially into large process, with rounded or bluntly pointed apex; valves long and narrow; each valve with small costal swelling and large number of elongate setae arising from outer portion of costa; valvula with well-defined spine patch; processes of valves extending to middle of uncus, in form of slender, rod-like process, going distad of spine patch, with short apical section curving inwardly; anellus weakly sclerotized, tapering from swollen base, sharply enlarged posteriorly, and with cristae of from three to eight elongate, heavy setae on each side; tegumen very wide posteriorly, saccus tapering anteriorly, bluntly V-shaped; aedeagus slightly longer than combined lengths of uncus, tegumen, and saccus, pointed posteriorly; vesica with one elongate, slender, heavily sclerotized, spine-like cornutus, curved at base, in length almost one-half of length of aedeagus. Abdomen with both sets of tufts on A_3 present; posterior double comb consisting of about 15 to 18 modified, well-spaced setae medially on each side, laterally with very many setae very closely spaced.

FEMALE GENITALIA: Sterigma weakly sclerotized, sublunate, with membranous ventral

lip; ductus bursae sclerotized posteriorly, outer portions appearing thicker than middle, with parallel sides, twice as long as wide, then enlarged into weakly striate posterior portion of corpus bursae, of about same length as sclerotized section; ductus seminalis arising from end of dorsal lobe on left side; corpus bursae large, somewhat angled anteriorly, right side and dorsally covered with numerous, low, corneous ridges.

TYPES: Guenée described *condensaria* from two males and one female. The lectotype, hereby designated, is the male in the collection of the British Museum (Natural History).

TYPE LOCALITY: Brazil.

RANGE: Southern Brazil (the states of Minas Gerais, Espírito Santo, Rio de Janeiro, São Paulo, Paraná, and Santa Catarina). This species is found in the Humid Subtropical Zone at elevations of from about 1000 to 6200 feet. The adults have been captured in February, April, July, August, November, and December. (See Appendix for locality data of specimens examined.)

REMARKS: Nineteen specimens and 10 genitalic dissections were studied. The upper surface of the wings of this species tend to have an olivaceous tint when freshly caught; older specimens fade to an ochraceous brown. The figure given by Guenée is not very accurately colored, as was noted by Druce.

None of the Central American localities, listed by Druce [1892 (1891–1900), p. 77], are applicable to this species.

***Pherotesia confusata* (Walker), new combination**

Plate 8, figure 4; text figures 78, 156

Pterocypha confusata WALKER, 1862, p. 1371.

This species is very similar to *condensaria* Guenée. It is larger in size than the preceding species, the males have the raised scent patch on the under side of the secondaries, and the females are virtually concolorous with the males. *Pherotesia confusata* occurs in southeastern Brazil and northern Argentina.

MALE: Head, thorax, and abdomen similar to those of *condensaria*.

UPPER SURFACE OF WINGS: Forewings with ground color pale buff or creamy white, heavily overlain with dark grayish brown,

olivaceous brown, and brownish black scales; cubital veins tending to be shaded with dull gray scales in median area of some specimens; cross lines similar to those of *condensaria*, with t. p. line tending to be more strongly dentate and with small area of dark scaling opposite cell in most specimens. Hind wings similar to those of *condensaria*.

UNDER SURFACE OF WINGS: Similar to that of *condensaria* but tending to be more ochraceous; apex of forewing without dark scaling; scent patch present on vein Cu₂ of secondaries.

LENGTH OF FOREWING: 23 to 27 mm.

FEMALE: Similar to male but with paler ground color above, with dark scaling tending to be heavier, and with t. p. band broader. Under surface of wings with more prominent discal spots and very broad, blackish brown s. t. band.

LENGTH OF FOREWING: 21 to 25 mm.

MALE GENITALIA: Very similar to those of *condensaria*, differing mainly as follows: uncus with apex very finely bifurcate in most specimens; costal tubercle of valve larger, broader than that of *condensaria*; processes of valves not reaching middle of uncus; anellus with cristae from about 15 to 20 elongate, heavy setae on each side; aedeagus subequal in length to combined lengths of uncus, tegumen, and saccus; vesica with one elongate, slender, heavily sclerotized, spine-like cornutus, anterior end bent at right angle to remainder of spine, with basal section narrowly swollen, in length slightly more than one-half of length of aedeagus.

FEMALE GENITALIA: Very similar to those of *condensaria*, differing mainly as follows: sterigma slightly larger, more membranous; ductus bursae with sclerotized posterior section shorter than larger, weakly striate, posterior portion of corpus bursae; ductus seminalis arising from small swelling ventroposteriorly of posterior portion of corpus bursae; corpus bursae with narrower posterior portion than that of *condensaria*.

TYPE: Walker described *confusata* from a single female; it is in the collection of the British Museum (Natural History).

TYPE LOCALITY: Brazil.

RANGE: Southern Brazil (the states of São Paulo, Rio de Janeiro, Santa Catarina, and Rio Grande do Sul) and northeastern Argen-

tina (the province of Misiones). This species is found in the Humid Subtropical Zone; the only elevation given on labels is for 2624 feet. The moths have been captured in February, April, September, and December. (See Appendix for locality data of specimens examined.)

REMARKS: Thirteen specimens and eight genitalic dissections were studied. While being very similar to *condensaria*, the present species can be distinguished by the presence of the scent patch in the males, by its larger size, and by the slightly paler wings. *Pherotesia confusata* averages about 2 mm. longer in the length of the forewing as compared to *condensaria*. In *confusata* the females tend to be more or less concolorous with the males, instead of being darker, as are those in *condensaria*. The range of this species seems to be centered more to the south in Brazil than that of *condensaria*.

The genitalia of *confusata* are very much like those of the preceding species. In *condensaria* the cristae are usually about three in number, although as many as eight may be present; in the present species the number is usually between 15 and 20. In the female genitalia the ductus seminalis arises from a small swelling in *confusata*, while in *condensaria* it comes from a lobe.

***Pherotesia simulatrix*, new species**

Plate 8, figure 5; text figure 79

This species is similar to *confusata*, as both are large and have the male scent patch on the under side of the secondaries. The present species tends to be darker than *confusata*, and genitalic differences are present in the male. This taxon occurs in Colombia.

MALE: Head, thorax, and abdomen similar to those of *condensaria*.

UPPER SURFACE OF WINGS: Forewings with ground color creamy white, heavily overlain with ochraceous brown and blackish brown scales; cross lines similar to those of *confusata*, more broadly and more heavily shaded with blackish brown scales; discal spot brownish black, elongate; subterminal area with patches of ground color in cells basal to s. t. line; terminal area tending to be heavily suffused with blackish brown scales, especially opposite cell and above tornus.

Hind wings similar to those of *confusata*, but more heavily suffused with ochraceous and blackish brown scales, with broad, solid, outer band.

UNDER SURFACE OF WINGS: Similar to that of *confusata*, but more heavily suffused with dark scaling, and with broader, heavier subterminal band; scent patch present on vein Cu_2 of secondaries.

LENGTH OF FOREWING: 26 mm. (holotype).

FEMALE: Unknown.

MALE GENITALIA: Very similar to those of *confusata*, differing mainly as follows: gnathos with median portion elongate, apex rounded; processes of valves extending beyond middle of uncus; anellus with cristae of one very heavy, very long seta and approximately 12 smaller, shorter setae situated anteriorly thereto on each side; aedeagus shorter than combined lengths of uncus, tegumen, and saccus; vesica weakly sclerotized, with poorly defined, spine-like structure.

FEMALE GENITALIA: Unknown.

TYPE: Holotype, male, Yuntas, near Cali, [Valle del Cauca], Colombia; in the collection of the United States National Museum.

RANGE: Colombia, known only from the type locality.

REMARKS: One specimen and one genitalic dissection were studied. This species is closely related to *confusata*; it can be separated from that species by the heavier and darker markings of the wings.

In the male genitalia, the cristae of *simulatrix* are of two sizes, one very heavy and the remainder slender and hair-like, and the vesica lacks the single, heavily sclerotized spine that is to be found in the two preceding species.

***Pherotesia potens* W. Warren**

Plate 8, figure 6; text figures 80, 157

Pherotesia potens W. WARREN, 1905b, p. 356.

Pherotesia parallelaria DOGNIN, 1916, p. 29. New synonymy.

This species closely resembles *confusata* but does not have the raised scent patch in the male. The genitalia of these two species are easily distinguished. The present species occurs from Bolivia to Costa Rica.

MALE: Head, thorax, and abdomen similar to those of *confusata*.

UPPER SURFACE OF WINGS: Forewings with ground color creamy white, more or less heavily overlain with buff and dark brown scales; cubital veins tending to be weakly shaded with grayish brown scales in median area of some specimens; cross lines similar to those of *condensaria*; median and subterminal areas with patches of ground color in cells basal to cross lines. Hind wings similar to those of *condensaria*.

UNDER SURFACE OF WINGS: Similar to that of *condensaria*; scent patch on vein Cu_2 of secondaries absent.

LENGTH OF FOREWING: 23 to 27 mm.

FEMALE: Similar to male but with paler ground color above, with dark scaling tending to be heavier, and with cross lines slightly more clearly represented. Under surface of wings more heavily suffused with dark scales and with broader subterminal band.

LENGTH OF FOREWING: 24 to 27 mm.

MALE GENITALIA: Uncus tapering, sides straight, terminal portion attenuated, short, with parallel sides, apex weakly bilobed; socius represented by about 12 to 18 setae; gnathos widely swollen medially, rugose, gently convex anteriorly and more definitely swollen posteriorly; each valve with costal swelling and large number of elongate, curved, capitate setae arising from central section of costa; valvula without spine patch; processes of valves extending just beyond base of uncus, arising from thickened cucullus, with arm from ventral margin extending as far as base of gnathos, gently curving outwardly at end, and second, more dorsal process arising in same area, more strongly outwardly curved and becoming wider apically, with numerous inwardly directed spines arising on ventral surface; anellus with rather broad base, narrowed medially, enlarged again posteriorly; cristae with one very long, heavy, S-shaped seta on each side, and with several small setae at base; tegumen very broad posteriorly, saccus tapering, V-shaped; aedeagus subequal in length to combined lengths of tegumen and saccus, dorsal surface more heavily sclerotized than ventral, posterior margin truncate; vesica unarmed. Abdomen with both sets of tufts on A_3 present;

posterior double comb consisting of about 12 to 16 modified, well-spaced setae medially on each side, laterally with very many setae very closely spaced.

FEMALE GENITALIA: Sterigma large, heavily sclerotized, median area subovoid, wider posterior to sinus vaginalis, laterally in form of large, wedge-shaped, anteriomedially directed plates, their ventral surface with many short setae, large ventral lip lightly sclerotized, its dorsal surface with many short setae; ductus bursae very short, weakly sclerotized; ductus seminalis arising ventrally from middle of corpus bursae; corpus bursae very large, thick, gently curved, with surface of anterior one-half minutely rugose and containing numerous fine ridges.

TYPES: The type of *potens* is in the British Museum (Natural History). Dognin described *parallelaria* from a single male specimen (U.S.N.M. No. 32980).

TYPE LOCALITIES: Yungas de La Paz, [La Paz], Bolivia (*potens*); Yahuarmayo, [Puno], Peru (*parallelaria*).

RANGE: Bolivia (the departments of La Paz and Cochabamba), southern and central Peru (the departments of Puno and Pasco), Colombia (the departments of Antioquia, Boyaca, and Norte de Santander), and Costa Rica. This species is found at moderate elevations in the mountainous regions at elevations of from about 1200 to 6600 feet. The adults have been taken in the months of January, April, June, August, October, November, and December. (See Appendix for locality data of specimens examined.)

REMARKS: Fifty-seven specimens and 12 genitalic dissections were studied. While being very similar in appearance to *confusata*, the present species can be recognized by its distribution and by the fact that the males do not have the raised scent patch on the under side of the secondaries.

The genitalia of both sexes of *potens* are quite distinct from those of the preceding species. The males can be separated by the two arms of the valves and by the very long, S-shaped seta of the cristae on each side. The female genitalia have a heavier and broader sterigma than do those of the preceding species, and the corpus bursae is of about equal width throughout its length.

***Pherotesia liciata* Dognin**

Plate 8, figure 7; text figure 81

? *Pherotesia liciata* DOGNIN, 1911a, p. 178.

This species is very similar to *potens*, but it tends to be slightly paler in color. Neither of these two taxa has the raised scent patch on the under side of the secondaries. The male genitalia are quite distinctive. *Pherotesia liciata* is found in Peru.

MALE: Head, thorax, and abdomen similar to those of *confusata*.

UPPER SURFACE OF WINGS: Forewings with ground color white or creamy white, more or less evenly overlain with buff, pale brown, and dark brown scales; cubital veins tending to be weakly shaded with grayish brown scales in median area of some specimens; cross lines similar to those of *condensaria*; subterminal area tending to have patches of ground color in cells basal to s. t. line, these overlain with darker scales in some specimens. Hind wings similar to those of *condensaria*.

UNDER SURFACE OF WINGS: Similar to that of *condensaria*; scent patch on vein Cu₂ of secondaries absent.

LENGTH OF FOREWING: 22 to 24 mm.

FEMALE: Unknown.

MALE GENITALIA: Uncus tapering, sides concave, apex broadly rounded; socius present; gnathos very large, as wide as base of uncus, heavily sclerotized, posterolateral margin broadly rounded, produced medially as prominent rounded lobe; each valve with costa weakly angled medially; valvula without spine patch, but with part of middle of valve sclerotized; processes of valves extending to middle of uncus, in form of sclerotized arm occupying middle one-third of outer margin of valve, with truncate or weakly concave base, broad, of even width, extending beyond sclerotized area in middle of valve, apex with numerous inwardly directed setae extending beyond inner margin of arm and curving away from face of valve; anellus with moderate base, narrowed medially and extending posteriorly as extremely long, slender, sclerotized process, extending beyond middle of uncus, terminal portion with small, ventral, serrate ridge; cristae absent; tegumen very broad posteriorly, saccus tapering, U-shaped; aedeagus equal to, or slightly longer than,

combined lengths of tegumen and saccus, short and broad, ventral surface weakly striate posteriorly; vesica armed with large spine, in length slightly shorter than aedeagus, heavily sclerotized, tapering posteriorly, the surface with many small ridges. Abdomen with both sets of tufts on A₃ absent, and with bristle comb tending to be deciduous; posterior double comb consisting of about 12 to 15 modified, well-spaced setae medially on each side, laterally with many setae closely spaced.

FEMALE GENITALIA: Unknown.

TYPE: Dognin described *liciata* from a single male specimen (U.S.N.M. No. 32976).

TYPE LOCALITY: Huancabamba, [Piura], Peru.

RANGE: Northern and central Peru (the departments of Piura and Pasco.) This species is apparently found at the higher elevations, as the labels read "6-10,000 feet." Not a single specimen was labeled as to month of capture. (See Appendix for locality data of specimens examined.)

REMARKS: Thirteen specimens and three genitalic dissections were studied. This species appears to be found between two isolated populations of *potens*, as it occurs in northern and central Peru. Both species are known from Pasco, but *liciata* has been taken at higher elevations than were the specimens of *potens*. As far as can be determined from the limited data available, *liciata* is to be found in the higher mountains, while *potens* is more of a foothills species.

These two species are quite similar in color and maculation, but *liciata* is slightly smaller, as the length of the male forewing averages about 2 mm. less than that of *potens*.

The male genitalia of these two species are very different. The present species is the only one in this group that lacks the lateral hair pencils on A₃, and it can be further recognized by the extremely long and slender anellus.

GROUP II

There is a great similarity in appearance between these species, with the upper surface of the forewings brownish or yellowish brown and having the median area slightly lighter. Because of the similarity in maculation between the species, the genitalia should be

studied. In the hind wings of the males there are usually nine veins (two species have eight), with veins M_2 and M_3 separate; nearly all of those with nine veins have a raised scent patch on vein Cu_2 below and an angulate wing outline. The females have eight veins in the hind wings. The adults of this group vary from being medium to being large, with the length of the forewing ranging from 17 to 27 mm.; the average size of the species extends from 20.5 to 24.5 mm.

The male genitalia have a well-developed gnathos, rounded, bluntly pointed, or digitate. The valves are variously ornamented, ranging from a simple sclerotized ridge to large and prominent, heavily sclerotized, and setose structures. The anellus is either moderate in size and weakly sclerotized or large, more heavily sclerotized, with the posterolateral margins attenuated. The aedeagus is simple or has a slender posterior projection, and the vesica is armed with one or more slender to heavy and large spines. The lateral hair pencils on A_3 are present in all known species.

The female genitalia have either a broad, sclerotized sterigma, or one that has been reduced to a narrow, membranous structure. The ductus bursae is short to moderate in length. The corpus bursae is large, curved, and of even size in many species and variously sclerotized posteriorly in three species. The ductus seminalis arises at or near the posterior end of the ductus bursae.

Fourteen species are included in group II. Six occur in the Andes Mountains of South America, while the remaining species occur in Central America and Mexico, with one of these also being found in Colombia.

***Pherotesia gaviota* (Dognin)**

Plate 8, figure 8; text figures 82, 158

Tephrosia gaviota DOGNIN, 1895, p. 114.

Pherotesia gaviota: DOGNIN, 1916, p. 29.

This is a medium-sized species that occurs in the eastern Andes Mountains from Colombia to northern Bolivia. The upper surface of the forewings is an olivaceous black (fading to brown), with a large discal spot, and with a narrow band of white marking the boundaries of the median area. The secondaries of the males have eight veins and do not have a

raised scent patch below. The genitalia of both sexes have good diagnostic characters.

MALE: Head, vertex pale buff, with variable amounts of grayish brown or dark gray scaling; front dark grayish brown or brown, narrowly paler at base in some specimens; palpi concolorous with front, with scattered light brown scales ventrally in many specimens. Thorax pale buff or light brown above, with scattered dark brown scales; collar dark brown, at least apically; patagia of mixed pale buff, light brown, and dark brown scales, some specimens with small, dark, transverse band; below pale buff; legs pale buff or light brown, variably mottled with grayish brown and blackish brown scales. Abdomen light brown or pale buff, variably overlain with grayish brown and dark brown scales; below with fewer dark scales.

UPPER SURFACE OF WINGS: Forewings with ground color light brown, heavily overlain with dark olivaceous brown, dark brown, or brownish black scales in basal and outer areas, median area paler, with white band distal to t. a. line and basal to t. p. line; cross lines distinct in most specimens, complete, without median line; t. a. line arising from large, dark costal spot, extending more or less straight across wing but being inwardly toothed on veins; median area with large, black discal spot, shaded basally and posteriorly by nebulous area of dark scales and occupying much of median area; t. p. line arising from large, dark costal spot, subparallel to outer margin, outwardly dentate on veins, weakly shaded distally by white in some specimens; subterminal and terminal areas heavily shaded with very dark scales opposite cell and above inner margin, continuing part way up wing in terminal area; s. t. line of blackish, round to elongate spots, larger anteriorly, shaded distally with thin white line; terminal line of large, black, intravenular spots; fringe checkered, concolorous with wing. Hind wings with eight veins; pale grayish brown, covered with long, thin, hair-like scales, overlain with brownish gray scales, becoming progressively darker and more numerous distally, with outer one-third of wing a unicolorous dark band; median line absent; discal spot small, dark; extradiscal line complete or partially complete; terminal line of dark grayish brown to black spots;

fringe contrasting in color, pale buff, with some grayish black or grayish brown scaling posteriorly.

UNDER SURFACE OF WINGS: Forewings light brown, very heavily overlain with dark gray or grayish brown scaling except along paler inner margin; median area white or grayish white, as on upper surface; hind wings without raised scent patch; grayish white, overlain with dark gray or grayish brown scaling; cross lines weakly represented in many specimens, obsolescent in others; discal spots large, grayish black, on all wings; outer portion of wings, except for white patch at apex of forewing, very broadly suffused with blackish gray band; fringes on all wings white or pale grayish white, checkered on veins in some specimens.

LENGTH OF FOREWING: 19 to 21 mm.

FEMALE: Similar to male, but tending to have slightly less dark scaling above and below.

LENGTH OF FOREWING: 20 to 25 mm.

MALE GENITALIA: Uncus tapering, terminal portion slightly attenuated, terminating in single point; socius absent; gnathos broad, enlarged medially and extending posteriorly, the process with parallel sides, terminally bluntly pointed with slightly attenuate apex, upper surface rugose; valves without costal swelling or tubercle; valvula without spine patch; valves with narrow, sclerotized strip extending from sacculus to outer portion of setose ridge in valvula; processes of valves extending at least as far as base of uncus, arising from thickened cucullus as short, slender base, becoming free arm, very slightly recurved apically, flattened, slender, and slightly tapering, with band of setae on inner surface extending to, and beyond, apex; anellus weakly sclerotized, slightly constricted medially, rounded apically; cristae absent; tegumen widest posteriorly, saccus tapering; aedeagus subequal to combined lengths of uncus, tegumen, and saccus; vesica with elongate, scobinate vesica, becoming more heavily sclerotized posteriorly, and with prominent, elongate, heavily sclerotized, slightly recurved, finger-like process. Abdomen with both sets of tufts on A_3 present; posterior double comb consisting of from 10 to 13 modified, well-spaced setae medially on

each side, laterally with several setae very closely spaced.

FEMALE GENITALIA: Sterigma large, with subovate lateral plate on each side, heavily and smoothly sclerotized, posteromedian edges raised, with sinus vaginalis situated posteriorly between lateral plates, with ventral lip weakly sclerotized; ductus bursae not reaching anterior margin of sterigma, joining corpus bursae dorsally, with surface at sinus vaginalis rugose; ductus seminalis arising on right side near posterior end of elongate, slender corpus bursae, the latter slightly curved and enlarged posteriorly, with rugose and partially ribbed surface.

TYPE: Dognin described *gaviota* from three male specimens. U.S.N.M. No. 32975 is hereby designated the lectotype; the genitalia are mounted on a slide labeled "August 1961 E.L.T. 1341."

TYPE LOCALITY: "Environs de Loja," [Loja], Ecuador. The lectotype is so labeled, although the locality is given as Loja in the original description.

RANGE: Colombia (the department of Boyaca), Ecuador (the province of Loja), Peru (the departments of San Martin, Cuzco, and Puno), and northern Bolivia (the department of Cochabamba). This species apparently flies in the eastern portion of the Andean foothills, at elevations of from about 1600 to 6000 feet. The adults have been captured in the months of January, October, and November. (See Appendix for locality data of specimens examined.)

REMARKS: Thirteen specimens and 11 genitalic dissections were studied. This relatively small species can be recognized by its having eight veins and no raised scent patch on the secondaries in the males, and by the whitish border to the median area of the forewings.

The male genitalia are recognizable in that they have the very long, free slender arms as the processes of the valves. The females are recognizable by the large, lateral, smoothly sclerotized plates of the sterigma with the posteriorly situated sinus vaginalis.

Pherotesia lima, new species

Plate 8, figure 9; text figures 83, 149

This relatively small species is similar to *gaviota* but lighter in color. The males have

eight (rarely nine) veins and no raised scent patch on the secondaries. Good genitalic characteristics are present in both sexes. This species occurs in Ecuador and northern Bolivia.

MALE: Head, thorax, and abdomen similar to those of *gaviota*, but tending to be slightly paler.

UPPER SURFACE OF WINGS: Forewings with ground color creamy white, variably overlain with pale buff and dark brown scales, with median area only slightly paler than basal and terminal areas; cross lines complete or partially complete, similar to those of *gaviota* but not so dentate; t. a. line geminate, arising from smaller inner and larger outer costal spots, extending either straight or weakly curved across wing, with broad, outer portion of line obsolescent in upper part of cubital cell; median area with large, blackish brown, discal spot, becoming dark brown outwardly, preceded on costa by dark costal spot; t. p. line continued from basal of two costal spots, broadly shaded distally with dark brown opposite cell and above inner margin; s. t. line, terminal area, terminal line, and fringe like those of *gaviota*. Hind wings similar to those of *gaviota* but slightly paler and with terminal band narrower.

UNDER SURFACE OF WINGS: Similar to those of *gaviota* but tending to be paler, and to have narrower terminal band and larger white spot at apex of forewings.

LENGTH OF FOREWING: 19 to 20 (holotype) mm.

FEMALE: Similar to male, but tending to have more dark brown scaling in subterminal area above and in terminal band of secondaries. Under surface more heavily suffused than that of male, and with wider terminal band.

LENGTH OF FOREWING: 22 mm. (allotype).

MALE GENITALIA: Uncus tapering, with sides almost straight, apical area curved ventrally, terminating in blunt apex; socius absent; gnathos of even width, medially with small, posteroventral, rounded swelling; valves with small costal swelling, without processes; sacculus swollen, lightly sclerotized; valvula with elongate, subtriangular process extending from near anterobasal portion to middle of valve, posterior margin sharply indented near distal end for almost full width

of process, apically tapering and becoming membranous, with group of heavy spines near end; anellus membranous; cristae of about 12 to 18 elongate setae of various lengths and diameters on each side; tegumen broad, saccus tapering, bluntly pointed; aedeagus slightly longer than combined lengths of uncus, tegumen, and saccus, lightly sclerotized ventrally and on left side; vesica with very long, flat, scobinate and finely setose, sclerotized band, in length about four-fifths of length of aedeagus. Abdomen with both sets of tufts on A_3 present; posterior double comb consisting of from 11 to 13 modified, well-spaced setae medially on each side, laterally with several setae very closely spaced.

FEMALE GENITALIA: Similar to those of *gaviota*; sterigma with lateral plates minutely punctate, narrower and more elongate than those of *gaviota*, and with slightly wider median separation; ductus bursae extending past anterior margin of sterigma, sclerotized posteriorly, becoming membranous anteriorly; corpus bursae slightly shorter and wider than that of *gaviota*.

TYPES: Holotype, male, and allotype, female, "Intaj," Ecuador (Buckley). This may be in error for Intag, the cordillera that separates the provinces of Pichincha and Imbabura. Paratype: Rio Songo, Boliva, elevation 750 meters (Fassl), one male. The holotype and allotype are in the collection of the British Museum (Natural History); the paratype is in the collection of the United States National Museum.

RANGE: Northern Ecuador (the provinces of Pichincha or Imbabura or both) and northern Bolivia. The only known elevation for this species is 2460 feet; no dates of capture are known.

REMARKS: Three specimens and three genitalic dissections were studied. This species is similar to *gaviota*, but it is paler in color, and the cross lines, particularly the t.a. line, are not so distinctly represented.

The venation of the secondaries in the male appears to be variable. The type and one hind wing of the paratype have eight veins, while the other secondary of the paratype has nine veins, as Sc is forked near the end.

The male genitalia are distinctive in that they lack a free arm on the inner face of the

valves, and the very long, file- or rasp-like vesica in the aedeagus is diagnostic. In the female genitalia the lateral plates of the sterigma are finely punctate, and are of a narrower, more elongate outline than those of *gaviota*, and the ductus bursae is longer.

Pherotesia subsimilis Dognin

Plate 8, figure 10; text figures 84, 150

Pherotesia subsimilis DOGNIN, 1912, p. 147.

This species gives the appearance of being a large, somewhat mottled, and olivaceous *gaviota*, but the secondaries of the males have nine veins, a raised scent patch, and an angulate outer angle. The genitalia have good specific characters. *Pherotesia subsimilis* occurs in the Andes Mountains from western Venezuela to Bolivia.

MALE: Head, thorax, and abdomen similar to those of *gaviota*.

UPPER SURFACE OF WINGS: Forewings with ground color creamy white or pale buff, variably overlain with ochraceous, olivaceous brown, and dark brown scales, resulting in a somewhat mottled appearance, with median area less heavily overlain with dark scaling; cross lines complete in most specimens, as are those of *gaviota*; t. a. line with large outward curves between veins; median area with medium- to large-sized black discal spot, shaded basally and posteriorly with dark brown scales, preceded on costa by dark spot and trace of median line in upper part of wing, with buff or ochraceous areas distal to discal spot in cell and cubital cell; t. p. line partially geminate in most specimens, shaded distally with dark brown or blackish brown opposite cell; s. t. line complete, spots in middle of wing reduced in size; terminal line of confluent brownish black spots, narrowly interrupted by veins in some specimens; fringe concolorous with wing, narrowly marked with white scales opposite veins in some specimens. Hind wings with nine veins; grayish brown, overlain with dark brown scales, becoming progressively darker and more numerous distally, with outer one-third of wing a unicolorous dark band in most specimens; median line absent; discal spot absent or weakly represented in some specimens; extradiscal line varying from being obsolescent to being partly complete; terminal line similar to that on forewings; fringe pale buff, contrasting in

color, with some grayish black or grayish brown scaling posteriorly in some specimens.

UNDER SURFACE OF WINGS: Forewings light grayish brown, heavily overlain with brownish gray and dark brown scales except along paler inner margin; patches of creamy white scaling distal to discal spot and at apex of wing, and smaller, elongate areas of dull buff in cells M_3 and Cu_1 in terminal area; hind wings with large, raised, scent patch; grayish white, overlain with dark gray or grayish brown scaling; cross lines absent or obsolescent; discal spots present, elongate, sublunate on forewings, round or attenuate on secondaries; outer portion of wings broadly suffused with blackish brown band; fringe concolorous with adjacent part of wing.

LENGTH OF FOREWING: 23 to 26 mm.

FEMALE: Similar to male, but with forewing more contrastingly colored owing to paler and yellower median area, and with heavier dark scaling in outer part of wing. Under surface of wings more heavily suffused with dark brown scales, and with heavier and broader terminal band.

LENGTH OF FOREWING: 22 to 27 mm.

MALE GENITALIA: Uncus elongate, constricted at about one-third and two-thirds of length, median section with convex sides, apical section with parallel sides, apex bluntly rounded, concave ventrally; socius absent; gnathos with elongate, heavily sclerotized, median, digitate process, its surface finely pitted; valves with small costal tubercle; valvula without spine patch; processes of valves extending from swollen sacculus, enlarged medially, constricted before large, inwardly directed, capitate apex, with row of elongate spines arising from lower margin, overlying triangular, sclerotized area extending outwardly from costa; anellus weakly sclerotized; cristae of two elongate and several short setae on each side; tegumen broadest posteriorly, saccus U-shaped; aedeagus shorter than combined lengths of uncus, tegumen, and saccus, with elongate, slender, spine-like process posteriorly on left side; vesica with heavily sclerotized, sharply pointed, spine-like cornutus, in length one-third of length of aedeagus. Abdomen with both sets of tufts on A_3 present; posterior double comb consisting of 12 or 13 modified, well-spaced setae medially on each side,

laterally with numerous setae very closely spaced.

FEMALE GENITALIA: Sterigma large, with subtriangular or subovate, sclerotized, rugose plate on each side, with sinus vaginalis situated medially, with membranous ventral lip; ductus bursae extending anteriorly of sterigma, sclerotized and rugose posteriorly, becoming membranous anteriorly, joining corpus bursae posterodorsally; ductus seminalis arising near posterior end of very long and slender corpus bursae.

TYPE: Dognin described *subsimilis* from a "series" of males. U.S.N.M. No. 32974 is hereby designated the lectotype; the genitalia are on a slide labeled "August 1961 E.L.T. 1340."

TYPE LOCALITY: San Antonio, [Valle del Cauca], Colombia.

RANGE: Western Venezuela (the state of Merida), Colombia (the departments of Norte de Santander, Antioquia, Tolima, and Valle del Cauca), Ecuador, Peru (the departments of Junin, Amazonas, Libertad, Puno, and Pasco), and Bolivia. This species has been taken at elevations of from about 1700 to 6600 feet in the months of January, February, March, May, October, November, and December. (See Appendix for locality data of specimens examined.)

REMARKS: Forty-three specimens and 14 genitalic dissections were studied. This large species is similar to *gaviota*, but the median area of the forewings is not so contrastingly colored, and the males have nine veins and the raised scent patch on the secondaries.

The male genitalia can be recognized by the capitate processes of the valves, and the female structures are distinguished by the rugose, subovate plates of the sterigma.

***Pherotesia ultrasimilis*, new species**

Plate 8, figure 11; text figures 85, 151

This is a large, dark-colored species that is very similar in appearance and in the wing structure of the male secondaries to *subsimilis*, but it has a less mottled appearance and is smaller. The genitalia of both sexes are distinctive. The present species occurs in Peru and Bolivia.

MALE: Head, thorax, and abdomen similar to those of *subsimilis*.

UPPER SURFACE OF WINGS: Forewings

with ground color creamy white or pale buff, heavily overlain with ochraceous, olivaceous brown, and dark brown scales, resulting in a more or less evenly colored wing, with median area only weakly differentiated; cross lines like those in *subsimilis*; median area tending to have ochraceous scaling along cross lines in some specimens and with small areas of it distal to medium-sized discal spot and, in some specimens, in cubital cell; terminal line and fringe like those of *subsimilis*. Hind wings with nine veins; similar to those of *subsimilis* but tending to be slightly grayer in color.

UNDER SURFACE OF WINGS: Similar to that of *subsimilis*, but paler in color; hind wings with raised scent patch.

LENGTH OF FOREWING: 20 to 26 mm.; holotype, 23 mm.

FEMALE: Similar to male, but with forewing more contrastingly colored owing to paler median area, and with heavier and darker scaling in outer part of wing. Under surface of wings more heavily suffused with dark brown scales, and with heavier and broader terminal band.

LENGTH OF FOREWING: 22 to 25 mm.; allotype, 25 mm.

MALE GENITALIA: Uncus tapering, curved ventrally, broadly rounded apically; socius absent; gnathos heavily sclerotized, with very long, tapering, median process, its surface finely pitted posterior to smoothly sclerotized gnathos ring; valves with small costal tubercle; valvula without spine patch but with group of approximately 10 to 18 heavy, posteriorly directed setae at base of costa; processes of valves arising medially, beyond swollen cucullus, anteriorly with elongate, slender, tapering, free arm extending beyond saccus, medially broadened, flat, posteriorly constricted beyond subtriangular sclerotized area extending outwardly from costa, tapered and curving inwardly, extending beyond end of uncus, inner margin of process with dense band of short, anteriorly directed setae, expanding anteriorly to cover free arm; anellus weakly sclerotized; cristae of one very long seta on each side, posteromedially directed, angled in middle and directed posteriorly, some specimens with two to four smaller setae in addition; tegumen broadest posteriorly, saccus tapered anteriorly; aedeagus shorter than combined lengths of uncus, tegu-

men, and saccus, with elongate, slender, spine-like process posteriorly on left side; vesica with single, moderately broad cornutus, with several elongate, slender spines arising from one edge, in length one-third of length of aedeagus. Abdomen with both sets of tufts on A_3 present; posterior double comb consisting of about 13 to 16 modified, well-spaced setae medially on each side, laterally with numerous setae very closely spaced.

FEMALE GENITALIA: Sterigma large, U-shaped, lateral areas rugose, scarcely separated from more strongly punctate posterior portion of ductus bursae, with slender membranous ventral lip; ductus bursae extending anteriorly of sterigma, in form of two lateral arms at sides of sinus vaginalis, constricted medially, joining corpus bursae posteriorly; ductus seminalis arising ventrally near posterior end of very long and slender corpus bursae.

TYPES: Holotype, male, Coosnipata, Paucartambo, Cuzco, Peru, November 20, 1951 (F. L. Woytkowski); allotype, female, Santo Domingo, Carabaya, [Puno], Peru. Paratypes: *Peru*: Same data as holotype, November 15, 29, 1951, December 3, 1951, three males; La Merced, [Pasco], February, 1951 (Rivas), one male; same data as allotype, two females, January, 1903 (wet season), June, 1902 (dry season), November, 1902 (wet season), elevation 6000–6500 feet (Ockenden), three males; Oxapampa, [Pasco], one male. *Bolivia*: Yungas del Palmar, May 3, 1959, elevation 1000 meters, one male; La Paz, elevation 1000 meters (Garlepp), one male; Rio Songo, elevation 750 meters (Fassl), three males; Incachaca, Cochabamba (J. Steinbach), three males; no further data, three males. The holotype is in the collection of the American Museum of Natural History; the allotype is in the collection of the United States National Museum; paratypes are in the collections of the American Museum of Natural History, British Museum (Natural History), and the United States National Museum.

RANGE: Southern Peru (the departments of Pasco, Cuzco, and Puno) and northern Bolivia (the departments of La Paz and Cochabamba). This species has been taken at moderate elevations in the Andean Region, from about 2500 to 6500 feet, in the months

of January, February, June, July, November, and December.

REMARKS: Twenty-three specimens and 12 genitalic dissections were studied. This species averages about 1 mm. or 2 mm. smaller in the length of the forewing than *subsimilis*. The color of the forewings is more even and less contrasting in this species than in the preceding taxon.

The genitalia of *subsimilis* and *ultrasimilis* are quite distinct. The present species can be recognized, in the male, by the fact that the elongate process of the valve has a very slender, free arm anteriorly and, in the female, by the U-shaped, rugose sterigma.

***Pherotesia lunata*, new species**

Plate 8, figure 12; text figure 86

This species closely resembles *ultrasimilis* in appearance, as far as can be determined from the limited material that is available, and the males of both species have a similar wing structure in the secondaries. The male genitalia have good diagnostic characters. The present taxon is found in Colombia.

MALE: Head, thorax, and abdomen similar to those of *subsimilis*.

UPPER SURFACE OF WINGS: Forewings with ground color creamy white, heavily overlain with ochraceous, grayish brown, and dark brown scales, with median area only weakly differentiated; cross lines, terminal line, and fringe like those of *subsimilis*; median area like that of *ultrasimilis*; subterminal area tending to have ochraceous scaling in cells. Hind wings with nine veins; similar to those of *subsimilis*, but with outer portion of wing less heavily darkened.

UNDER SURFACE OF WINGS: Similar to that of *subsimilis*, but with narrower terminal band, broader pale outer border, and upper part of t. p. line extending to vein M_3 , and with ochraceous scaling in cells between that and terminal line; secondaries with raised scent patch.

LENGTH OF FOREWING: 24 mm. (holotype).

FEMALE: Unknown.

MALE GENITALIA: Similar to those of *ultrasimilis*, differing mainly as follows: uncus more sharply constricted basally, terminal portion elongate, with parallel sides, broadly rounded apically; gnathos with median digitate process slightly broader; processes of

valves situated medially near outer margin, of even width except for slightly tapered ends, gently curved, apices rounded, inner margin with dense band of anteriorly directed setae.

FEMALE GENITALIA: Unknown.

TYPE: Holotype, male, Sierra del Libane, Colombia, elevation 6000 feet (H. H. Smith); in the collection of the British Museum (Natural History).

RANGE: Colombia, known only from the type locality.

REMARKS: One specimen and one genitalic dissection were studied. Unfortunately the type is somewhat rubbed and perhaps faded; additional details as to the coloration and maculation of this species may have to be given when additional material comes to hand.

The male genitalia indicate a close relationship with *ultrasimilis*. The present species can be recognized by the large, broad, gently lunate process on each valve; this structure in *ultrasimilis* is longer, and the ends are sharply tapered and elongate.

***Pherotesia subjecta* W. Warren**

Plate 8, figure 13; text figures 87, 152

Pherotesia subjecta W. WARREN, 1905a, p. 357. DOGNIN, 1916, p. 29 (placed as synonym of *gaviota*). PROUT, 1931, p. 177 (valid species).

Pherotesia abjecta PROUT, 1931, p. 177. New synonymy.

This is another species that is very similar to *ultrasimilis*, but it lacks the raised scent patch on the under side of the secondaries in the males. The genitalia offer good specific characteristics for the recognition of the species. *Pherotesia subjecta* is found in Peru and Bolivia.

MALE: Head, thorax, and abdomen similar to those of *subsimilis*.

UPPER SURFACE OF WINGS: Forewings with ground color creamy white or pale buff, heavily overlain with ochraceous and dark brown scales, resulting in a more or less evenly colored wing, with median area scarcely differentiated; cross lines like those of *subsimilis*; median area with narrow band of irregular width distal to t. a. line and basal to t. p. line, with indication of indistinct, dark median line in some specimens; s. t. line with spots shaded distally by narrow margin of ground color; terminal line and fringe like

those of *subsimilis*. Hind wings with nine veins; similar to those of *ultrasimilis*.

UNDER SURFACE OF WINGS: Similar to that of *ultrasimilis*; hind wings without raised scent patch.

LENGTH OF FOREWING: 23 to 25 mm.

FEMALE: Similar to male, but with forewing more contrastingly colored owing to paler median area. Under surface of wings more heavily suffused with dark brown scales, and with heavier and broader terminal band.

LENGTH OF FOREWING: 23 mm.

MALE GENITALIA: Similar to those of *ultrasimilis*, differing mainly as follows: uncus with terminal portion more slender, apex curved ventrally; gnathos with median digitate process broader; valves without group of spines at base of costa; processes of valves very large, heavily sclerotized, U-shaped, with small basal connection to swollen cucullus near base of valve, attached along distal portion of cucullus, terminating in rounded, outwardly curved apex, process sharply curved near base of valve, extending parallel with costa in form of tapering, free arm, extending as far as apex of outer portion, inner margin of outer portion broadly set with numerous, short, anteriorly directed setae, these continuing on other arm of process, covering most of surface.

FEMALE GENITALIA: Sterigma large, lateral plates heavily sclerotized, with several transverse ridges, elongate, ovate, anterior section and inner margins irregular, median area lightly sclerotized, increasing in width posteriorly, almost reaching posterior margins of lateral plates, with numerous transverse ridges, and with membranous ventral lip; ductus bursae not attaining anterior margin of sterigma, tapering anteriorly, joining corpus bursae posteriorly; ductus seminalis arising ventrally very near posterior end of long and slender corpus bursae, the latter membranous but with posterior one-third, particularly on right side, lightly sclerotized and with finely punctate surface.

TYPES: Warren described *subjecta* from a single male specimen; it is in the collection of the British Museum (Natural History). Prout also had a single male before him when he described *abjecta*; this specimen is in the Tring Museum.

TYPE LOCALITIES: Santo Domingo, Cara-

baya, [Puno], Peru, 6500 feet, wet season (*subjecta*); Oconeque, Carabaya, [Puno], Peru, 7000 feet, dry season (*abjecta*).

RANGE: Southern Peru (the department of Puno) and Bolivia (the department of Cochabamba; "Chaco"). The only recorded altitudes for this species are 6500 and 7000 feet. The adults have been taken in both the wet and dry seasons; July is the only month mentioned on the labels of the specimens examined. (See Appendix for locality data of specimens examined.)

REMARKS: Five specimens and four genitalic dissections were studied. The adults of both *subjecta* and *ultrasimilis* are very similar; males of the present species do not have the raised scent patch on the under side of the secondaries.

The male genitalia of *subjecta* are easily recognized by the very prominent U-shaped processes of the valves. The female genitalia are characterized by the fact that the elongate lateral plates of the sterigma have several transverse ridges, by the ridged, lightly sclerotized area between the plates, and by the very short ductus bursae.

***Pherotesia malinaria* Schaus**

Pherotesia malinaria SCHAUS, "1900" [1901b], p. 247.

This species resembles *ultrasimilis*, but the males have the raised scent patch on the under side of the secondaries. The genitalia, particularly of the male, are quite distinctive. *Pherotesia malinaria* occurs from Mexico to Panama in two subspecific populations, distinguishable primarily by the male genitalia.

***Pherotesia malinaria malinaria* Schaus**

Plate 8, figure 14; text figures 89, 153

Tephrosia condensaria: DRUCE (not Guenée), 1892 (1891-1900), p. 77 (*partim*).

Pherotesia malinaria SCHAUS, "1900" [1901b], p. 247.

This population, which occurs from Mexico to Costa Rica, tends to be slightly darker than the Panamanian population. Prominent differences between these two taxa are present in the male genitalia.

MALE: Head, thorax, and abdomen similar to those of *subsimilis*.

UPPER SURFACE OF WINGS: Forewings with ground color creamy white or pale buff,

heavily overlain with ochraceous and dark brown scales, resulting in a more or less evenly colored wing, with median area scarcely differentiated; cross lines like those of *subsimilis*, but tending to be more strongly dentate; median area tending to have weak, diffuse band of ochraceous scaling along cross lines, and with larger area of it distal to angulate discal spot; subterminal area with weak band of ochraceous scaling in outer portion from vein M_1 to inner margin; terminal line and fringe similar to those of *subsimilis*. Hind wings with nine veins; similar to those of *subsimilis* but tending to be of more uniform coloration, lacking distinct outer band.

UNDER SURFACE OF WINGS: Similar to that of *subsimilis* but tending to be more uniform in color; hind wing with raised scent patch.

LENGTH OF FOREWING: 21 to 23 mm.

FEMALE: Similar to male, but with forewing more contrastingly colored owing to paler median area and paler outer portion of subterminal area, with darker scaling opposite cell in subterminal and terminal areas; hind wings tending to have weakly defined median and s. t. bands. Under surface of wings more contrastingly marked than that of male, with incomplete terminal band on all wings.

LENGTH OF FOREWING: 20 to 23 mm.

MALE GENITALIA: Uncus sharply tapering, apex curved ventrally, terminating in single point; socius absent; gnathos in form of circular band, enlarged medially into ventrally projecting process, slightly enlarged at end; valves with neither costal tubercle nor swelling; valvula without spine patch; cucullus swollen; sacculus with narrow sclerotized strip extending from base to near end of cucullus, then branching, with area of long, posteriorly directed, heavy spines extending from near base of costa diagonally across face of valve, with irregular anterolateral margin near base, becoming slightly wider distally, extending to base of uncus; anellus membranous; cristae of one elongate seta on each side; tegumen broad, saccus tapering anteriorly; aedeagus subequal in length to combined lengths of uncus, tegumen, and saccus, slender, tapering posteriorly; vesica with single, elongate, spine-like process occupying more than one-half of length of aedeagus. Abdomen with both sets of tufts on A_3 present;

posterior double comb consisting of about 12 modified, well-spaced setae medially on each side, laterally and medially with numerous setae very closely spaced.

FEMALE GENITALIA: Sterigma large, lightly sclerotized, lateral areas subtriangular, surface punctate, with several raised ridges, separated from median, smoothly sclerotized longitudinal strip, enlarged and rounded posteriorly, with membranous ventral lip; ductus bursae extending well anterior of sterigma, with median area weakly sclerotized, joining corpus bursae posteriorly; ductus seminalis arising dorsally from right side; corpus bursae elongate, slender, with weakly spiculate band near anterior end.

TYPE: Schaus gave no indication in the original description of the number of specimens in the type series, but he did have both sexes, as they are mentioned. U.S.N.M. No. 12505 is hereby designated the lectotype; the male genitalia are on a slide labeled "August 1961 E.L.T. 1339."

TYPE LOCALITY: Jalapa, [Veracruz], Mexico.

RANGE: Mexico (the states of Veracruz and Oaxaca), Guatemala, and Costa Rica. This species is found in the Tropical Wet and Dry Zone, occurring in the lower mountains at elevations of from about 2000 to 4600 feet. The adults have been captured in February, April, September, October, and December. (See Appendix for locality data of specimens examined.)

REMARKS: Sixteen specimens and eight genitalic dissections were studied. It was difficult to describe the coloration and pattern of the males adequately owing to a lack of fresh material; the entire series of specimens, with the exception of one worn male and three females, were probably taken at the end of the last century.

This population can be immediately recognized by the elongate, heavily spinose process extending across the face of the valves in the male genitalia. The female genitalia differ from those of the preceding species by the less heavily sclerotized, and more transversely situated, lateral plates of the sterigma.

The single known male from Costa Rica has the processes of the valves with less spining than is found in typical Mexican examples. The anterolateral margin of the

process near the base has an irregular outline, with three or four large spines arising from it. The shape of this area is similar to that of Mexican specimens; in the following subspecies this margin is perfectly smooth.

***Pherotesia malinaria minuisca*, new subspecies**

Plate 8, figure 15; text figure 88

Tephrosia condensaria: DRUCE (not Guenée), 1892 (1891–1900), p. 77 (*partim*).

This subspecies, which occurs in Panama, has more variegated coloring on the upper surface of the wings than does nominate *malinaria*. Prominent differences are present in the male genitalia between these two populations.

MALE: Head, thorax, and abdomen similar to those of nominate *malinaria*.

UPPER SURFACE OF WINGS: Forewings with ground color pale buff, overlain with dark brown scales and heavily suffused with ochraceous, resulting in a mottled appearance; maculation like that of nominate *malinaria* but with larger areas of ochraceous scaling. Hind wings like those of *m. malinaria*.

UNDER SURFACE OF WINGS: Similar to that of *m. malinaria* but tending to have more ochraceous scaling.

LENGTH OF FOREWING: 22 to 23 mm.; holotype, 22 mm.

FEMALE: Similar to that of nominate *malinaria*.

LENGTH OF FOREWING: 19 to 20 (allotype) mm.

MALE GENITALIA: Similar to those of *m. malinaria*, but differing mainly as follows: valves with more prominent sclerotized strip in sacculus, with smaller area of long, posteriorly directed heavy spines, these occurring on distal, enlarged portion only, and with straight anterolateral margin near base.

FEMALE GENITALIA: Similar to those of *m. malinaria*, but tending to have median sclerotized strip of sterigma slightly broader, with less membranous area between it and lateral areas.

TYPES: Holotype, male, Volcan de Chiriqui, [Chiriqui], Panama, May–June, 1898 (M. de Mathan); allotype, female, Volcan de Chiriqui, [Chiriqui, Panama], elevation 3000–4000 feet (Champion), identified as "*Tephrosia condensaria* Guenée, B. C. A. Lep.

Het., Godman-Salvin coll." Paratypes, all from Panama: Same data as holotype, one male; same data as allotype, one male, below 4000 feet, one female; Chiriqui, two males. The holotype and allotype are in the collection of the British Museum (Natural History); paratypes are in the collections of that institution and of the United States National Museum.

RANGE: Panama (the province of Chiriqui). The only dates of capture are "May-June," with the elevation being given as between 3000 and 4000 feet.

REMARKS: Seven specimens and five genitalic dissections were examined. While this subspecies is similar in appearance to *m. malinaria*, rather striking genitalic differences are present in the male. The present subspecies is characterized by the greatly reduced area of spining on the diagonal process.

***Pherotesia supplanaria* (Dyar), new combination**

Plate 9, figures 1, 2; text figures 90, 159

Tephrosia supplanaria DYAR, 1913, p. 315.

This species is similar to *malinaria*, but it is smaller and more contrastingly marked. The genitalia of the two are very distinct. The present species occurs in Mexico and Costa Rica.

MALE: Head, thorax, and abdomen similar to those of *malinaria*, but with more pale buff scaling.

UPPER SURFACE OF WINGS: Forewings with ground color pale buff, more or less heavily overlain with ochraceous brown and dark brown scales, producing a mottled appearance; cross lines distinct, as in *malinaria*, but less dentate and tending to converge more toward inner margin; discal spot dark, angulate, succeeded by large patch of ground color; s. t. line of more or less connected dark spots, shaded distally with white, curving outwardly on vein M_2 , otherwise paralleling outer margin; terminal line and fringe like those of *malinaria*. Hind wings with nine veins, outer margin only weakly angled; pale grayish buff; median line absent; discal spot gray, angled; extradiscal line weakly represented; s. t. line weak but present for length of wing; terminal line like that on forewing, tending to become obsolescent anteriorly.

UNDER SURFACE OF WINGS: Forewings pale

buff, overlain with grayish brown and brownish black scales except for paler inner margin and for buff costal margin, spotted with dark brown scales; hind wings with small, raised, scent patch, concolorous with forewings, more evenly overlain with brown scales; discal spots present on all wings, tending to be angulate; maculation weakly reflected in upper part of forewing, with prominent, dark s. t. patch opposite cell, and with pale grayish white spot at apex; secondaries with incomplete, narrow s. t. band.

LENGTH OF FOREWING: 20 mm.

FEMALE: Similar to male, but with maculation tending to be more contrastingly represented. Under surface with broad, dark subterminal band extending to vein M_3 .

LENGTH OF FOREWING: 17 mm.

MALE GENITALIA: Uncus sharply tapering, terminal portion elongate, with parallel sides, apex bluntly rounded; socius absent; gnathos extremely large, heavily sclerotized, extending anteriorly nearly one-half of combined lengths of tegumen and saccus, sharply curved inwardly and then posteriorly, extending to beyond middle of uncus as elongate, parallel-sided projection, apex tapering to point; valves with weak costal swelling, with distal one-half narrowed; valvula without spine patch; sacculus not differentiated; cucullus with narrow, median, sclerotized strip extending to middle of valve, curving toward costa, slightly widened distally, with distal margin then subparallel raised, setose ridge; anellus membranous; cristae of two or three elongate setae on each side; tegumen very broad, saccus tapering; aedeagus longer than combined lengths of uncus, tegumen, and saccus, slender, thinner than width of terminal portion of valve; vesica armed with ventral pointed spine, sclerotized posteriorly and on left side, and with longer, dorsal, spine-like process having curved and heavily sclerotized posterior end. Abdomen with both sets of tufts on A_3 present; posterior double comb consisting of about 14 modified, well-spaced setae medially on each side, laterally with numerous setae very closely spaced.

FEMALE GENITALIA: Sterigma very small, membranous; lamella antevaginalis and lamella postvaginalis absent; ductus bursae short, heavily sclerotized and rugose, widest

at posterior margin, tapering, joining corpus bursae dorsally; ductus seminalis arising from posterior margin of corpus bursae; corpus bursae elongate, sharply constricted medially, posterior section sclerotized and rugose, becoming membranous anteriorly, portion of corpus bursae anterior to constriction large, rounded, membranous.

TYPE: Dyar described *supplanaria* from a single female (U.S.N.M. No. 14550).

TYPE LOCALITY: Misantla, [Veracruz], Mexico.

RANGE: Mexico (the state of Veracruz) and Costa Rica. The unique type was taken in October; the elevations at which the two specimens were taken range from about 1000 to 4000 feet. (See Appendix for locality data of specimens examined.)

REMARKS: Two specimens and two genitalic preparations were studied. The type of this species is in rather worn condition, the head is missing, and the forewings are held on by glue. As far as can be determined, the maculation is quite similar to that of *malinaria*, but *supplanaria* is smaller, paler, more contrastingly marked and has a more distinct and angled s. t. line of the forewings, and paler secondaries.

The male genitalia are distinctive in having an extremely long gnathos and two spines in the vesica. The female genitalia are also unique in that the ductus bursae is large and heavily sclerotized and the corpus bursae has a median constriction.

***Pherotesia falcis*, new species**

Plate 9, figure 3; text figure 91

The males of this species are similar to that sex of *malinaria*, although the margin of the hind wing is not so strongly angled. The female is unknown. Genitally, *falcis* is closely allied to *supplanaria*. The present taxon occurs in Mexico.

MALE: Head, thorax, and abdomen similar to those of *malinaria* but tending to have more pale buff scaling on thorax and abdomen.

UPPER SURFACE OF WINGS: Forewings with ground color pale buff, evenly and heavily overlain with ochraceous brown and dark brown scales; cross lines like those of *malinaria*; discal spot weakly represented; s. t. line, terminal line, and fringe like those of

malinaria. Hind wings with nine veins, outer margin only weakly angled; grayish buff; maculation obsolescent except for traces of s. t. line; terminal line like that on forewing, tending to become obsolescent anteriorly.

UNDER SURFACE OF WINGS: Forewings pale grayish buff, overlain with grayish brown scales except for paler inner margin and for buff costal margin, spotted with brown scales; hind wings with very small, raised, scent patch; pale buff, lightly overlain with pale brown scales; discal spots weakly indicated on forewings, prominent on secondaries; maculation obsolescent except for s. t. line in upper part of primaries, a very weak brown patch opposite cell, and secondaries with weak s. t. band.

LENGTH OF FOREWING: 22 mm. (holotype).

FEMALE: Unknown.

MALE GENITALIA: Uncus gently tapering, wide, apex broadly rounded; socius absent; gnathos very large, sclerotized, extending anteriorly nearly one-fourth of combined lengths of tegumen and saccus, then curving posteroventrally and extending to near base of uncus, median portion as wide as base of uncus anteriorly, slightly tapering, apex broadly rounded, posterior portion with weak, median, irregularly notched ridge on dorsal surface, lateral and posterodorsal surfaces of process coarsely punctate; valves similar to those of *supplanaria*, but with median sclerotized strip extending past widest part of valve; anellus membranous; cristae of from four to six elongate, very slender setae on each side; tegumen very broad, saccus tapering; aedeagus shorter than combined lengths of uncus, tegumen, and saccus, moderately thick, in width equal to width of terminal portion of valve; vesica armed with median group of two thick and several short thin spines and with longer, terminal, sickle-shaped spine. Abdomen with both sets of tufts on A_3 present; posterior double comb consisting of about 15 modified, slender, well-spaced setae medially on each side, laterally with several setae very closely spaced.

FEMALE GENITALIA: Unknown.

TYPE: Holotype, male, Popocatepetl Park, [Mexico], Mexico, July, 1906, elevation "800-1000 feet"; in the collection of the United States National Museum. Very probably the elevation label on the type is incor-

rect, as this area is much higher than indicated; 8000 to 10,000 feet is more likely to be correct.

RANGE: Central Mexico, known only from the type locality in the Highlands Zone.

REMARKS: One specimen and one genitalic dissection were studied. The type is somewhat worn but, as far as can be determined, it closely resembles *malinaria*.

The male genitalia indicate that this species is closely allied to *supplanaria*. The present taxon can be distinguished by the broader uncus, the shorter and wider gnathos, and by the different ornamentation of the vesica.

It is possible that this male is the male of *supplanaria* and that the male of that species should have been described as the new species. However, the normal pattern of distribution for species of *Melanolophia* and *Pherotesia* is that a moth from Misantla, Veracruz (the type locality of *supplanaria*), in the Tropical Wet and Dry Zone, will be expected also to occur in part of Costa Rica. Such is the distribution of *P. malinaria* and *caeca*, for example, as well as for *M. flexilinea* and *sadrina*. The state of Mexico is in the Highlands Zone, and it is thought likely that the female of this species is yet to be discovered.

***Pherotesia hamata*, new species**

Plate 9, figure 4; text figures 92, 160

This species is very similar to both *falcis* and *malinaria*. The color, maculation, and scent patch of the males tend to be more like those of *malinaria*, while the genitalia of that sex are more similar to those of *falcis*. This taxon occurs in Mexico.

MALE: Head, thorax, and abdomen similar to those of *malinaria*, but with more buff scales.

UPPER SURFACE OF WINGS: Ground color pale buff, evenly and heavily overlain with dark grayish brown and blackish brown scales; cross lines like those of *malinaria*; discal spot black, angulate, shaded distally by area of ground color extending to t. p. line; s. t. line angled opposite cell, shaded distally with white scales. Hind wings with nine veins, outer margin only weakly angled; grayish brown, overlain with grayish brown and brown scales; discal spot, extradiscal and sub-

terminal lines weakly indicated; terminal line dull black; fringe buff.

UNDER SURFACE OF WINGS: Forewings pale grayish buff, overlain with gray and grayish brown scaling except for paler inner margin; maculation of upper surface reflected on under side, with paler spot at apex. Hind wings with raised scent patch; pale buff, coarsely irrorate, with dark grayish brown scales; discal spot dull black, prominent; upper portion of wing with dark grayish brown subterminal band.

LENGTH OF FOREWING: 21 to 23 mm.; holotype, 21 mm.

FEMALE: Similar to male, but with forewing more contrastingly colored owing to paler median area and paler outer portion of subterminal area, with variable amount of orange-brown scaling in latter, and with larger areas of dark scaling opposite cell in subterminal and terminal areas; discal spot larger; hind wings tending to have slightly clearer maculation. Under surface of wings much more contrastingly marked than that of male, with more extensive areas of black scaling in outer portion of wings and with creamy white areas at apex and in cells M_3 and Cu_1 of forewing, and along outer margin of hind wing.

LENGTH OF FOREWING: 19 to 23 mm.; allotype, 22 mm.

MALE GENITALIA: Similar to those of *falcis*, differing mainly as follows: uncus slightly narrower and more elongate, apex more truncate; gnathos smaller, median portion sharply tapered and extending to near middle of uncus, apex pointed, posterior portion with median projection on dorsal surface, surface of gnathos smooth; valves with median sclerotized strip concave basally, extending distally more toward outer margin than in *falcis*; cristae consisting of one very long, heavy seta and from four to six minute setae at base; aedeagus equal to combined lengths of uncus, tegumen, and saccus; vesica armed with large spine patch, occupying almost one-half of length and slightly over one-half of width of aedeagus, individual spines very small anteriorly, becoming progressively longer along left side and posteriorly, and with prominent, terminal, curved, sclerotized piece. Abdomen like that of *falcis*.

FEMALE GENITALIA: Sterigma with rounded

or elliptical median area, anterolaterally widened to join ductus bursae, with several small transverse ridges; ductus bursae larger than sterigma, dorsoventrally flattened, heavily sclerotized, with punctate surface, lateral margins straight, asymmetrical, left side longer than right, latter angled outward to join corpus bursae, with maximum width about one-half of length of apophyses anteriores; ductus seminalis arising dorsally on right side near posterior end of corpus bursae; corpus bursae with posterior end enlarged, lightly sclerotized, punctate, becoming thinner medially, slightly enlarged anteriorly, in many cases with faint, extremely weakly spiculate band one-third of distance from anterior end.

TYPES: Holotype, male, and allotype, female, Mo Cuou, Cerro Pelon, Municipio Yolox, Oaxaca, Mexico, September 17, 1962, elevation 7050 feet (E. C. Welling). Paratypes, all from Mexico: Same data as types, two males and four females; Cerro Pelon, Municipio Yolox, Oaxaca, September 12, 1961, elevation 7052 feet (E. C. Welling), one female; Vista Hermosa, Municipio Comaltepec, Oaxaca, September 24, 1962, elevation 4650 feet (E. C. Welling), one female. All the type material is in the collection of the American Museum of Natural History.

RANGE: Known only from the type series, taken in the mountains of Oaxaca, Mexico.

REMARKS: Ten specimens and five genitalic dissections were studied. In color and maculation this species is very similar to *malinaria*.

The male genitalia of *hamata* show a great similarity to those of *falcis*. The present species can be distinguished by the narrower, more pointed gnathos, and by the different armature of the vesica, including the larger spine patch and the bigger terminal curved piece. The female genitalia are of the same type as is found in *malinaria*, but *hamata* has a greatly reduced sterigma and a broader and more heavily sclerotized ductus bursae.

***Pherotesia funebris* (Schaus), new combination**

Plate 9, figure 5; text figure 161

Melanolophia funebris SCHAU, 1912, p. 426.

This species is similar to *supplanaria* but can be distinguished by the broader and darker outer area of the forewings, and by the

ochraceous brown band that extends the length of vein Cu and Cu₁. *Pherotesia funebris* is known from Costa Rica.

MALE: Unknown.

FEMALE: Head, thorax, and abdomen similar to those of *malinaria*.

UPPER SURFACE OF WINGS: Forewings with ground color white, very heavily overlain with blackish brown scales, with buff scales along costal margin, and with prominent band of ochraceous brown scales extending length of cubital vein, going from near base to wing margin on Cu₁; cross lines indicated by solid shadings in basal and subterminal areas, with median area of ground color, lightly overlain with dark scaling; t. a. line gently curved; median shade occupying large section of anterior portion of median area, obliterating discal spot; t. p. line subparalleling outer margin, tending to be concave between veins; subterminal and terminal areas very broad, blackish brown, with traces of s. t. line anteriorly and posteriorly; terminal area with patch of ground color at apex and along outer margin in cells M₃ and Cu₁; terminal line of black intravenular spots, scarcely differentiated, but some spots narrowly shaded basally with white scales; fringe concolorous with wing. Hind wings gray, overlain with grayish black scales, particularly in outer portion of wings, producing broad band; maculation obsolescent; fringe white, faintly buff at base.

UNDER SURFACE OF WINGS: Forewings pale grayish white, heavily overlain with dark grayish brown and brownish black scales, except for buff costal margin, spotted with dark brown scales; hind wings concolorous with forewings; discal spots present on all wings, those on forewings poorly defined; subterminal and terminal areas broad, darker than basal portion of wing, upper part of forewings darkest, with white patches distal to discal spot, at apex, and terminally in cells M₃ and Cu₁ of forewings, and very narrowly at apex of hind wings; fringes like those on upper surface.

LENGTH OF FOREWING: 23 mm.

MALE GENITALIA: Unknown.

FEMALE GENITALIA: Sterigma large, with big, subtriangular, smoothly sclerotized plates posterolaterally of sinus vaginalis, and with small, weakly sclerotized, raised strip be-

tween them; ductus bursae short, sclerotized, tapering anteriorly to join corpus bursae dorsally; corpus bursae elongate, angulate posteriorly, with posterior portion heavily sclerotized and rugose.

TYPE: Schaus described *funnebris* from the female, but he did not specify how many specimens were included in the type series. The specimen bearing the type label is U.S.N.M. No. 17604.

TYPE LOCALITY: Juan Vinas, Costa Rica.

RANGE: Costa Rica. The type was taken in January. (See Appendix for locality data of specimen examined.)

REMARKS: One specimen and one genitalic preparation were studied. The unique type of *funnebris* can be distinguished by the longitudinal ochraceous brown band on the cubital vein of the forewings, and by the very broad, brownish black, terminal and subterminal areas of the forewings.

The female genitalia are distinguished by the large, lateral triangular plates of the sterigma and by the sclerotized posterior portion of the corpus bursae.

***Pherotesia caeca*, new species**

Plate 9, figure 6; text figures 93, 162

Tephrosia condensaria: DRUCE (not Guenée), 1892 (1891-1900), p. 77 (*partim*).

This is a medium-sized species that occurs from Mexico to western Panama, and it is very similar to *malinaria*. The genitalia of both sexes are distinctive.

MALE: Head, thorax, and abdomen similar to those of *malinaria*.

UPPER SURFACE OF WINGS: Forewings with ground color pale buff, more or less heavily overlain with ochraceous brown, dark brown, and grayish black scales, producing a finely mottled and spotted appearance; cross lines moderately distinct, as are those of *malinaria*; discal spot dark, varying from thin line to broad band, with area distal thereto of ground color; t. p. line shaded distally with dark grayish black scales, shiny in fresh specimens, opposite cell and above inner margin. Hind wings with nine veins; less heavily overlain with dark scales than forewings, particularly in basal and anterior regions; median line usually absent, weakly indicated near anal margin in some speci-

mens; discal spot small or obsolescent; extra-discal and s. t. lines weakly represented in lower portion of wing; terminal line like that on forewing, tending to become obsolescent anteriorly.

UNDER SURFACE OF WINGS: Forewings pale grayish buff, variably mottled with grayish brown or grayish black scales except for paler inner margin and for buff costal margin, spotted with dark grayish brown scales; hind wings with raised scent patch; concolorous with, and more finely spotted than, forewings; discal spots present on all wings, tending to be angulate; maculation weakly reflected from upper surface, with nebulous s. t. band weakly indicated.

LENGTH OF FOREWING: 19 to 22 mm.; holotype, 20 mm.

FEMALE: Similar to male, but with upper surface of forewings tending to be somewhat less heavily overlain with dark scales, particularly in median and outer portion of subterminal areas; discal spot large, black; maculation tending to be more clearly defined than in male; hind wings tending to have more complete s. t. line or, in some specimens, a grayish black band. Under surface more heavily suffused with dark scales, with more complete s. t. band on all wings.

LENGTH OF FOREWING: 19 to 22 mm.; allotype, 19 mm.

MALE GENITALIA: Uncus tapering, terminal portion elongate, slightly swollen, rounded apically; socius absent; gnathos enlarged medially, in shape of inverted V, sides thin and with apex attenuated; valves narrowed from lower margin in middle, with posterior portion slender, without costal swelling and without spine patch; valves with processes absent but with slender, sclerotized band extending up cucullus to point of constriction, then sharply curving inwardly to meet anterior extension of setose ridge of valvula, the included area sclerotized, and with smaller outward spur at junction; anellus broad, occupying one-half of maximum width of saccus, elongate, rugose, with pair of slender, tapering, elongate processes arising from posterodistal angles, extending to middle of uncus, apically with closely appressed setae; tegumen short, saccus elongate, tapering; aedeagus shorter

than combined lengths of uncus, tegumen, and saccus, broad posterior portion bluntly pointed; vesica with very large, heavily sclerotized cornutus, enlarged and striate basally, slightly tapering posteriorly, apex weakly foot-like, in length almost as long as aedeagus. Abdomen with both sets of tufts on A_3 present; posterior double comb consisting of 12 to 14 modified, well-spaced setae medially on each side, laterally with numerous setae very closely spaced.

FEMALE GENITALIA: Sterigma very small, membranous; ductus bursae very short, broad, heavily sclerotized, widening into short dorsal arm of corpus bursae; ductus seminalis arising from short sclerotized caecum on right side posteriorly; corpus bursae elongate, posterior one-half sclerotized and rugose, wide, with caecum on right side, tapering and membranous anteriorly.

TYPES: Holotype, male, Orizaba, Veracruz, Mexico, 1937 (C. C. Hoffmann); allotype, female, Teocelo, [Veracruz], Mexico, September. Paratypes: *Mexico*: Orizaba, [Veracruz], one female, November, 1907, July, 1908 (R. Muller), one male, one female; Cordova, [Veracruz], May, one male; Jalapa, [Veracruz], two females; Coatepec, [Veracruz], 1913, one female; Misantla, Veracruz, April-May, 1912 (W. Gugelmann), one female; Veracruz, two females; La Granja, Chiapas, 1930 (C. C. Hoffmann), one male; Cerro Pelon, Municipio Yolox, Oaxaca, September 13, 1961, elevation 7052 feet (E. C. Welling), one male; no further data (C. C. Hoffmann), one male. *Guatemala*: Purulha, July (Schaus and Barnes), one male; Zapote (G. C. Champion), one female, identified as "*Tephrosia condensaria* Guenée, B. C. A. Lep. Het., Godman-Salvin coll." *Costa Rica*: Tuis, June, July, 1907, no date, elevation 2400 feet, one male, two females; Juan Vinas, June (W. Schaus), two females; Sitio, May, June, two females; Orosi, elevation 1200 meters (Fassl), one female. *Panama*: Chiriqui, two females. The holotype and allotype are in the collection of the American Museum of Natural History; paratypes are in the collections of the American Museum of Natural History, of the British Museum (Natural History), and of the United States National Museum. Also studied but not in-

cluded in the paratype series are the following specimens: "T.A.C.," one female; "Amazons," one female.

RANGE: Mexico (the states of Veracruz, Chiapas, and Oaxaca), Guatemala, Costa Rica, and Panama (the province of Chiriqui). This species is found in the foothills and mountains at elevations of about 1000 to over 7000 feet. The adults have been captured in July, September, and November.

REMARKS: Twenty-nine specimens and 14 genitalic dissections were studied. Fresh specimens tend to have the maculation softer and less contrasting than do older, more faded examples.

This species can be recognized by the very large cornutus in the male, and by the configuration of the corpus bursae in the female genitalia.

Pherotesia alterata W. Warren

Plate 9, figure 7; text figures 94, 163

Pherotesia alterata W. WARREN, 1905a, p. 356.

This species is very similar to *caeca*, but tends to be slightly browner in color, more finely mottled, and a bit larger. Good genitalic differences are present by which to separate the two species. The present taxon occurs in Costa Rica, Panama, and Colombia.

MALE: Head, thorax, and abdomen similar to those of *caeca*.

UPPER SURFACE OF WINGS: Forewings with ground color buff or ochraceous buff, more or less heavily overlain with ochraceous brown and dark brown scales, producing a finely mottled and spotted appearance; cross lines and maculation like those of *caeca*. Hind wings similar to those of *caeca*.

UNDER SURFACE OF WINGS: Similar to that of *caeca*; hind wings with small, raised, scent patch.

LENGTH OF FOREWING: 20 to 21 mm.

FEMALE: Similar to male, but with upper surface of forewings tending to be slightly more heavily overlain with dark scales except for median area; hind wings with more definite maculation, tending to have subterminal area dark gray. Under surface more heavily suffused with dark scales, with more complete s. t. band on all wings.

LENGTH OF FOREWING: 22 to 23 mm.

MALE GENITALIA: Very similar to those of *caeca*, differing mainly as follows: anellus very broad, occupying about two-thirds of maximum width of saccus, elongate, rugose, with pair of slender, tapering, elongate processes arising from posterodistal angles, extending beyond base of uncus, apically rugose; aedeagus slightly shorter than combined lengths of uncus, tegumen, and saccus; vesica with very large, heavily sclerotized cornutus, striated basally and longitudinally, apex tapering and slightly recurved, in length about five-eighths of length of aedeagus.

FEMALE GENITALIA: Sterigma large, ovoid, asymmetrical, sclerotized, inner area relatively flat, surrounded by narrow, ridged groove, particularly on left side; lamella postvaginalis small, appearing as apically bifurcate lobe, continued anteriorly on right side as narrow, curved, ribbon-like process; ductus bursae short, arising posteriorly on right side of sterigma, sclerotized and striate around opening, becoming membranous, then joining short, striate, and rugose arm of corpus bursae; ductus seminalis arising from posterior point of corpus bursae; corpus bursae relatively broad, enlarged anteriorly; signum minute.

TYPE: Warren described *alterata* from a single male specimen; it is in the collection of the British Museum (Natural History).

TYPE LOCALITY: Cananche, Cundinamarca, Colombia.

RANGE: Costa Rica, Panama (the province of Chiriqui), and Colombia (the department of Cundinamarca). This species has been taken at moderate elevations in the mountains, from about 2000 to 4600 feet, during the months of January, February, June, August, and November. (See Appendix for locality data of specimens examined.)

REMARKS: Ten specimens and seven genital dissections were studied. While being quite similar to *caeca*, the present species is more evenly and finely mottled with dark scales on the upper surface of the wings. This pattern is more noticeable when the females of the two species are compared.

The male genitalia of this species are similar to those of *caeca* but can be recognized by the broader anellus and by the different

shape of the cornutus, as it is not enlarged anteriorly. The female genitalia of these two species are very different and can be easily separated.

***Pherotesia bifurca*, new species**

Plate 9, figure 8; text figure 95

This species, in appearance, resembles a dark *malinaria*, as it has the upper surface of the wings heavily suffused with dark scales, which virtually obliterate all maculation. The female is unknown. The male genitalia are very distinctive. The species is known from Guatemala.

MALE: Head, thorax, and abdomen similar to those of *caeca*, but with more brownish gray scaling.

UPPER SURFACE OF WINGS: Forewings with ground color ochraceous buff, heavily overlain with dark brown and blackish brown scales and strigations, producing a finely mottled appearance; cross lines obscured by dark scaling, but apparently similar in course to those of *caeca*; discal spot small, dark, shaded distally by patch of ground color; subterminal and terminal areas tending to have elongate areas of ground color in cells, with dark scaling concentrated on veins, especially in lower part of wing; terminal line of black intravenular spots; fringe checkered, dark gray, with pale buff at vein endings. Hind wings with nine veins; heavily overlain with grayish black scales and hair-like scales except along paler costal margin; without discal spot and cross lines, except for weak indication of latter near paler anal angle; terminal line weaker than that on forewings; fringe dark gray posteriorly, becoming paler anteriorly.

UNDER SURFACE OF WINGS: Forewings grayish buff, mottled with grayish black scales except for paler inner margin and for buff costal margin, spotted with dark grayish brown and black scales; hind wings with raised scent patch on vein Cu₂; concolorous with forewing; discal spots present on all wings, tending to be elongate and angled; maculation absent except for poorly defined, broad, s. t. band.

LENGTH OF FOREWING: 22 mm. (holotype).

FEMALE: Unknown.

MALE GENITALIA: Similar to those of *caeca*, differing mainly in anellus and aedeagus as follows: anellus slender, extremely long, becoming bifurcate shortly before middle, the arms parallel, extending beyond uncus, almost to ends of valves, surface rugose, becoming shortly setose apically; aedeagus slightly longer than combined lengths of uncus, tegumen, and saccus, anterior portion swollen, weakly constricted medially, bluntly rounded posteriorly; vesica with elongate, weakly sclerotized process.

FEMALE GENITALIA: Unknown.

TYPE: Holotype, male, Volcan Santa Maria, Guatemala, June (Schaus and Barnes); in the collection of the United States National Museum.

RANGE: Guatemala. The single known specimen was captured in June.

REMARKS: One specimen and one genitalic dissection were studied. This species is similar to the preceding ones, but it is darker and has less clearly defined maculation. The upper surface of the secondaries is covered with numerous, fine, hair-like setae, a characteristic that has not been noted in the previous species.

The male genitalia are very distinctive in having an extremely long, bifurcate anellus.

MELANOTESIA, NEW GENUS

Similar in most characters to *Melanolophia*, differing mainly as follows: Antennae of male more shortly pectinate, terminal one-fifth simple; antennae of female simple. Abdomen with large double comb of very many setae between seventh and eighth segments.

Forewings with 12 veins, one areole; R_1 and R_2 from top of cell, separate for entire length, R_2 with weak cross vein to R_{3+4} , R_5 arising basad of cross vein; M_1 from in front of upper angle; dc arcuate. Hind wings with margin weakly concave between veins; with eight veins, Sc not branching; $m+1dc$ arcuate.

MALE GENITALIA: Uncus tapering, apical portion laterally compressed, terminating in single point; socius absent; gnathos well sclerotized, enlarged medially; valves large, elongate, with costal swelling and numerous

elongate setae from end, ornamentation symmetrical, with raised, sclerotized, slender process perpendicular to face of valve beyond middle; anellus very strongly developed, sclerotized, extending posteriorly as two elongate, setose lobes, extending to or beyond middle of uncus; aedeagus with sclerotized strip posteriorly; vesica unarmed or with row of short setae.

FEMALE GENITALIA: Apophyses posteriores approximately three times as long as apophyses anteriores; sterigma with lamella antevaginalis membranous, lamella postvaginalis sclerotized, extending width of ostium bursae; ductus bursae not differentiated; ductus seminalis arising somewhat mediad on right side from large swelling of corpus bursae; the latter large, sclerotized posteriorly, membranous and swollen anteriorly; signum moderate, angulate.

The maculation of the two included species is very similar. The forewings are grayish black or black, with three large white spots in the basal and central part of the wing, and three more slightly smaller white spots along the outer margin, with the cross lines weakly indicated by still smaller white dots. The secondaries have a broad, dark outer band and a large white median spot that may or may not be continued to the base of the wing. The under side is similar in color and maculation to the upper surface.

EARLY STAGES: Unknown.

TYPE SPECIES: *Calospila* ? *siderata* Dognin.

RANGE: Andes Mountains of South America, from Colombia to Bolivia.

The adults of the two species of this genus can be recognized by their pattern of spots on the very dark wings, and by the fact that vein R_1 of the forewings is free.

The very long and setose posterior projections of the anellus in the male genitalia are characteristic. These projections are similar to those of some species of *Pherotesia*, particularly of *bifurca* Rindge, but the species can be distinguished otherwise by the venation, the pattern, and the configuration of the valves. The female genitalia are also similar to those of some species of the preceding genus, particularly *caeca* Rindge. The structures of the females of the present genus can be separated from those of *Pherotesia* by the

presence of the signum, and from those of the species of *Melanolophia* by the heavily sclerotized posterior portion of the corpus bursae.

KEY TO SPECIES

BASED ON MACULATION

- Upper surface of wings grayish black, with white spots; secondaries with basal two-thirds white *siderata*
 Upper surface of wings black, or black with ochraceous scaling, with white spots; secondaries black, with central white spot *intensa*

BASED ON MALE GENITALIA

- Aedeagus with vesica armed with thick row of cornuti *siderata*
 Aedeagus with vesica unarmed. *intensa*

Melanotesia siderata (Dognin), new combination

Plate 9, figure 9; text figure 96

Calospila ? *siderata* DOGNIN, 1901, p. 184.

Melanoscia albimacula W. WARREN, 1904, p. 112. New synonymy.

This is a large, grayish black species with white spots, the secondaries of which are mainly white, with a broad, dark, outer border. It occurs in Bolivia and southern Peru.

MALE: Head, vertex, front, and palpi grayish black, with scattered paler scales. Thorax above with mixed white, grayish brown, and grayish black scales, collar with round whitish spot on each side in some specimens, posterior margin of thorax with tuft of white scales; below light brown or pale buff; legs concolorous with under side of thorax, variably spotted with brown scales. Abdomen concolorous with thorax.

UPPER SURFACE OF WINGS: Forewings grayish black; maculation white, consisting of two large spots, one below branching of vein Cu and Cu₂ and other one distal to vein dc, with smaller white spots below cubital vein near base of wing, near base of cell, and three along outer margin, in cells R₄, M₂₊₃, and Cu₂; cross lines represented by small white spots, in some cases lunate in outline, t. a. and median lines weakly represented, t. p. and s. t. lines stronger; discal dot scarcely discernible; fringe checkered concolorous with wing. Hind wings white, with outer one-third

solidly grayish black, and with grayish black scaling basally in lower portion of wing below elongate discal spot; s. t. line more or less complete, of white spots; fringe white.

UNDER SURFACE OF WINGS: Similar to upper surface but tending to be slightly paler.

LENGTH OF FOREWING: 22 to 24 mm.

FEMALE: Similar to male but tending to be slightly more heavily marked with white scales on wings.

LENGTH OF FOREWING: 27 mm.

MALE GENITALIA: Uncus sharply tapered from base, terminal portion elongate, slender, curved ventrally; gnathos becoming broadened ventrolaterally, curving posteriorly as very wide, truncate, median projection with finely setose surface; valves with cucullus lightly sclerotized, with more heavily sclerotized, thickened area along inner portion, with small, flap-like protuberance near end, and with raised, subtriangular, pointed outwardly projecting, sclerotized piece distal thereto, arising from weakly sclerotized area on face of valve; anellus with broad, lightly sclerotized base, sharply narrowed and becoming more heavily sclerotized, extending posteriorly as two elongate lobes, heavily setose distally, reaching to middle of uncus; tegumen broad, almost square in outline, saccus U-shaped; aedeagus broad, shorter than combined lengths of uncus, tegumen, and saccus, with rounded, sclerotized, posterior end; vesica armed with band of short, thickly set setae.

FEMALE GENITALIA: Sterigma with lamella postvaginalis well sclerotized, median portion enlarged posteriorly, concave at mid-line, transversely rugose, the lateral portions more smoothly sclerotized; corpus bursae large, not constricted at ostium bursae, anterior portion swollen; membranous, posterior portion heavily sclerotized, the sclerotized area extending farther anteriorly on right side than on left and including large protuberance medially, from end of which arises ductus seminalis; signum in form of an elongate, semicircular, lightly sclerotized area, with two diverging, inverted, and widely V-shaped arms, more heavily sclerotized at apices.

TYPES: Dognin described *siderata* from a single male specimen (U.S.N.M. No. 32972). Warren described *albimacula* from two males;

these are now in the collection of the British Museum (Natural History).

TYPE LOCALITIES: Rio Songo, Bolivia (*siderata*); Santo Domingo, Carabaya, [Puno], Peru (*albimacula*).

RANGE: Bolivia (the department of Cochabamba) and southern Peru (the departments of Puno and Cusco). This species has been taken at altitudes of from approximately 2450 to 6560 feet in the months of February, April, and November. (See Appendix for locality data of specimens examined.)

REMARKS: Nine specimens and six genitalic dissections were studied. This species has grayish black wings, which are paler in color than those of the following species. The secondaries have the basal two-thirds white, although part of the lower portion is shaded with dark scales.

Melanotesia intensa (Dognin), new combination and new status

Plate 9, figure 10; text figure 97

Melanoscia siderata var. *intensa* DOGNIN, 1909, p. 232.

Melanotesia intensa is a large black or ochraceous black species with white spots, the secondaries of which are black with a large central white spot. This species is found in Colombia.

MALE: Head, thorax, and abdomen similar to those of *siderata* but tending to be darker, with more prominent tuft of white scales at posterior end of thorax.

UPPER SURFACE OF WINGS: Forewings black, with variable amount of dull ochraceous scaling, particularly in subterminal area; maculation of pure white spots similar to that of *siderata*. Hind wings black, tending to become grayish black anteriorly of large white central spot; otherwise like that of *siderata*.

UNDER SURFACE OF WINGS: Similar to upper surface, tending to be slightly paler and to have more whitish scaling along inner and anal margins of wings.

LENGTH OF FOREWING: 23 to 27 mm.

FEMALE: Unknown.

MALE GENITALIA: Uncus sharply tapered from base, terminal portion laterally compressed, curving ventrally; gnathos becoming

broadened ventrolaterally, curving posteriorly as wide, rounded, median projection; valves with cucullus narrow, lightly sclerotized, with more heavily sclerotized, thickened area along inner portion, slightly widened posteriorly and with small ventral ridge, curving inwardly to meet thin, raised, transverse, sclerotized projection, arising from weakly sclerotized area on face of valve, extending slightly beyond outer margin of valve, with ventral surface shortly spinose; anellus with broad, lightly sclerotized base, narrowed and becoming more heavily sclerotized, extending posteriorly as two elongate, heavily setose lobes, reaching to middle of uncus; tegumen broad, almost square in outline, saccus U-shaped; aedeagus broad, shorter than combined lengths of uncus, tegumen, and saccus, with posterior end on left side sclerotized; vesica unarmed.

FEMALE GENITALIA: Unknown.

TYPES: Dognin described *intensa* from two males. The lectotype, hereby designated, is U.S.N.M. No. 32973 and has the genitalia mounted on a slide labeled "March 1962 E.L.T. 1490."

TYPE LOCALITY: Cali, [Valle del Cauca], Colombia, according to the original description. The lectotype is labeled merely "Colombie. Fassl."

RANGE: Colombia (the departments of Valle del Cauca and Norte de Santander). This species has been found in the Andes Mountains at elevations of from about 5900 to 7800 feet; the adults have been captured in January, February, March, August, October, and November. (See Appendix for locality data of specimens examined.)

REMARKS: Sixteen specimens and three genitalic dissections were studied. This species is similar to *siderata* in size and maculation, but the color of the wings is blacker. The secondaries of *intensa* have a large, median, white spot, while the basal two-thirds of the wings are white in *siderata*.

The male genitalia of these two species are also similar. The raised process on the face of the valves is different in shape; in *intensa* it is a slender transverse piece, while in *siderata* it is subtriangular or angular in outline. The former species has an unarmed vesica, while *siderata* has a thick row of cornuti.

LIST OF SPECIES, WITH THEIR KNOWN DISTRIBUTION

GENUS *Melanolophia* HULST

GROUP I

- | | |
|-----------------------------------|--------------------------------------|
| 1. <i>delinquaria</i> (Walker) | Southern Brazil, Paraguay, Argentina |
| 2. <i>modica</i> , new species | Southern Brazil, Paraguay, Argentina |
| 3. <i>apicalis</i> (W. Warren) | Southern Brazil, Paraguay, Argentina |
| 4. <i>vitta</i> , new species | Southern Brazil |
| 5. <i>praeapicata</i> (W. Warren) | Southern Brazil, Paraguay, Argentina |
| 6. <i>centosa</i> (Schaus) | Southern Brazil, Paraguay, Argentina |

GROUP II

- | | |
|------------------------------------|---------------------------|
| 7. <i>striata</i> (W. Warren) | Peru, Bolivia |
| 8. <i>substriata</i> , new species | Colombia, British Guiana |
| 9. <i>subatrata</i> (Dognin) | Southern Brazil, Paraguay |
| 10. <i>inatrata</i> , new species | Bolivia, Peru |
| 11. <i>conspicua</i> Schaus | Costa Rica |
| 12. <i>fugitaria</i> Schaus | Costa Rica |

GROUP III

- | | |
|--|-------------------------|
| 13. <i>umbrosa</i> , new species | Bolivia, Peru, Colombia |
| 14. <i>olivescens</i> (W. Warren) | Ecuador |
| 15. <i>tenebrosa</i> (W. Warren) | Northern Argentina |
| 16. <i>muscitincta</i> (W. Warren) | Peru |
| 17. <i>piura</i> , new species | Peru |
| 18. <i>producta</i> , new species | Ecuador |
| 19. <i>vulsa</i> , new species | Colombia |
| 20. <i>limosa</i> (Dognin) | Ecuador |
| 21. <i>accurata</i> Prout | Colombia |
| 22. <i>rubrica</i> , new species | Guatemala |
| 23a. <i>eudoxa eudoxa</i> , new subspecies | Bolivia, Peru |
| b. <i>eudoxa simpla</i> , new subspecies | Colombia, Venezuela |
| 24a. <i>trisurca trisurca</i> (Dognin) | Ecuador |
| b. <i>trisurca elongata</i> , new subspecies | Peru, Bolivia |
| 25. <i>munda</i> (W. Warren) | Peru |
| 26. <i>vegranda</i> , new species | Ecuador, Costa Rica |

GROUP IV

- | | |
|---|--|
| 27. <i>perversa</i> , new species | Southern Brazil |
| 28. <i>triloba</i> , new species | Mexico, Guatemala, Costa Rica |
| 29. <i>penicilla</i> , new species | Ecuador, Peru, Bolivia |
| 30. <i>atrifascia</i> , new species | Canal Zone |
| 31. <i>homofascia</i> , new species | Venezuela |
| 32a. <i>sadrina sadrina</i> (Schaus) | Mexico, British Honduras, Guatemala, Honduras,
Costa Rica |
| b. <i>sadrina conara</i> , new subspecies | Colombia |
| 33. <i>sadrinaria</i> , new species | Mexico, Costa Rica |

GROUP V

- | | |
|---|--|
| 34a. <i>imitata imitata</i> (Walker) | Southern Alaska, British Columbia, southwestern
Alberta, northern Idaho, Washington, Oregon,
northern California |
| b. <i>imitata barbara</i> McDunnough | Santa Barbara County, California |
| c. <i>imitata cana</i> , new subspecies | Southern California |
| 35. <i>centralis</i> McDunnough | Arizona, Colorado, Nevada, New Mexico |
| 36. <i>bostar</i> (Druce) | Guatemala, Mexico |
| 37a. <i>flexilinea flexilinea</i> (W. Warren) | Mexico, Honduras |

- b. *flexilinea fragosa*, new subspecies
- c. *flexilinea digna* Prout
- 38a. *canadaria canadaria* (Guenée)
- b. *canadaria crama*, new subspecies
- c. *canadaria choctawae*, new subspecies
- 39a. *signataria signataria* (Walker)
- b. *signataria timucuae*, new subspecies
- 40a. *imperfectaria imperfectaria* (Walker)
- b. *imperfectaria solida*, new subspecies
- 41. *fimbriata*, new species
- 42. *parma*, new species

Costa Rica, Panama, northern Ecuador
Colombia
Southern Canada, northern United States
Eastern United States
Southeastern United States
Southeastern Canada, eastern United States
Florida
Southern Texas
Mexico
Costa Rica, Panama, northern Ecuador
Panama, Costa Rica, Mexico

GROUP VI

- 43. *orthotis* Prout
- 44. *divergens* (W. Warren)
- 45. *intervallata* (W. Warren)
- 46. *pseudovallata*, new species
- 47a. *reducta reducta* (W. Warren)
- b. *reducta meridiana*, new subspecies
- c. *reducta borea*, new subspecies
- 48. *corza* (Dognin)
- 49. *madefactaria* (Dyar)
- 50. *reductaria*, new species
- 51. *dextera*, new species
- 52. *isoforma*, new species
- 53. *isometra*, new species
- 54. *attenuata*, new species
- 55. *argilaria* (Guenée)
- 56. *synargilaria*, new species
- 57. *commotaria* (Maassen)
- 58. *dislocata* (W. Warren)
- 59. *mutabilis* (W. Warren)
- 60. *venatia*, new species
- 61. *elegia*, new species
- 62. *mallea*, new species
- 63a. *bugnathos bugnathos*, new subspecies
- b. *bugnathos contracta*, new subspecies
- c. *bugnathos elaphra*, new subspecies

Southwestern Brazil, Bolivia, Peru, Colombia
French Guiana
Costa Rica, Panama, Ecuador, Peru, southern
Brazil
Bolivia
Southern Ecuador, northern and central Peru
Southern Peru, Bolivia
Colombia
Southern Ecuador, Bolivia
Dominica
Southern Peru, Bolivia
Colombia
Colombia
Ecuador
Costa Rica, Panama
Colombia
Peru
Venezuela, Colombia, Ecuador
Peru
Jamaica, British Guiana
Bolivia
Mexico
Colombia, Ecuador, Peru, Bolivia
Bolivia, Peru
Ecuador
Panama, Costa Rica

GROUP VII

- 64. *spatiosata* (Dognin)
- 65. *conta*, new species
- 66. *minca*, new species
- 67. *rima*, new species
- 68. *eucheria* Schaus
- 69. *consimilaria* (Walker)
- 70. *immarcata* (Schaus)
- 71. *semarmata*, new species
- 72. *agnataria* (Snellen)
- 73. *muscosa* (W. Warren)
- 74. *paraconara*, new species
- 75. *orthoconara*, new species

Bolivia, Peru
Peru
Colombia
Colombia, Peru
Southern Brazil
Southern Brazil
Peru, Bolivia
Peru
Colombia, Venezuela
Ecuador
Colombia
Panama, Costa Rica

GENUS *Pherotesia* SCHAUS

GROUP I

- 1. *condensaria* (Guenée)
- 2. *confusata* (Walker)

Southern Brazil
Southern Brazil, Argentina

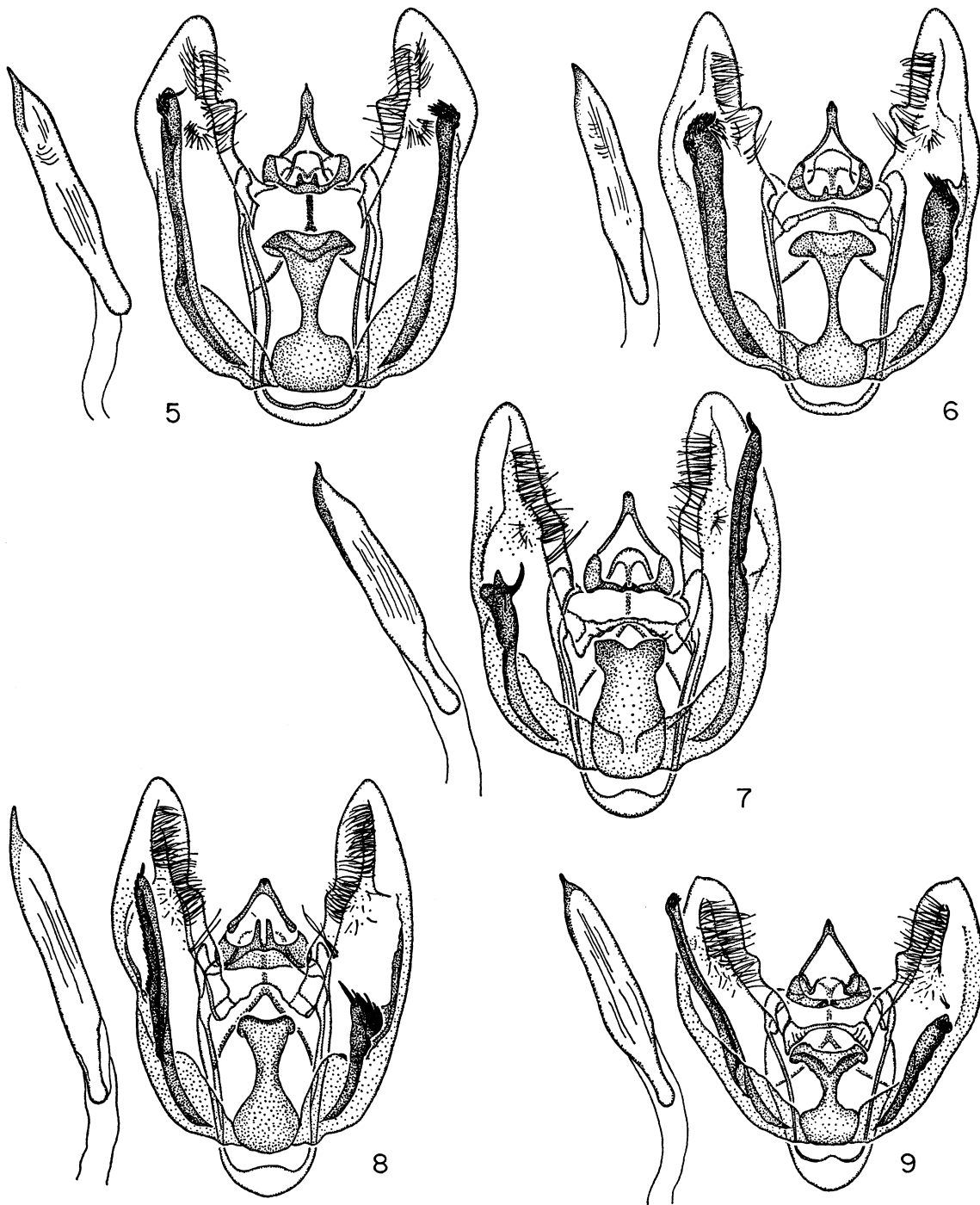
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| 3. <i>simulatrix</i> , new species | Colombia |
| 4. <i>potens</i> W. Warren | Bolivia, Peru, Colombia, Costa Rica |
| 5. <i>liciata</i> Dognin | Peru |

GROUP II

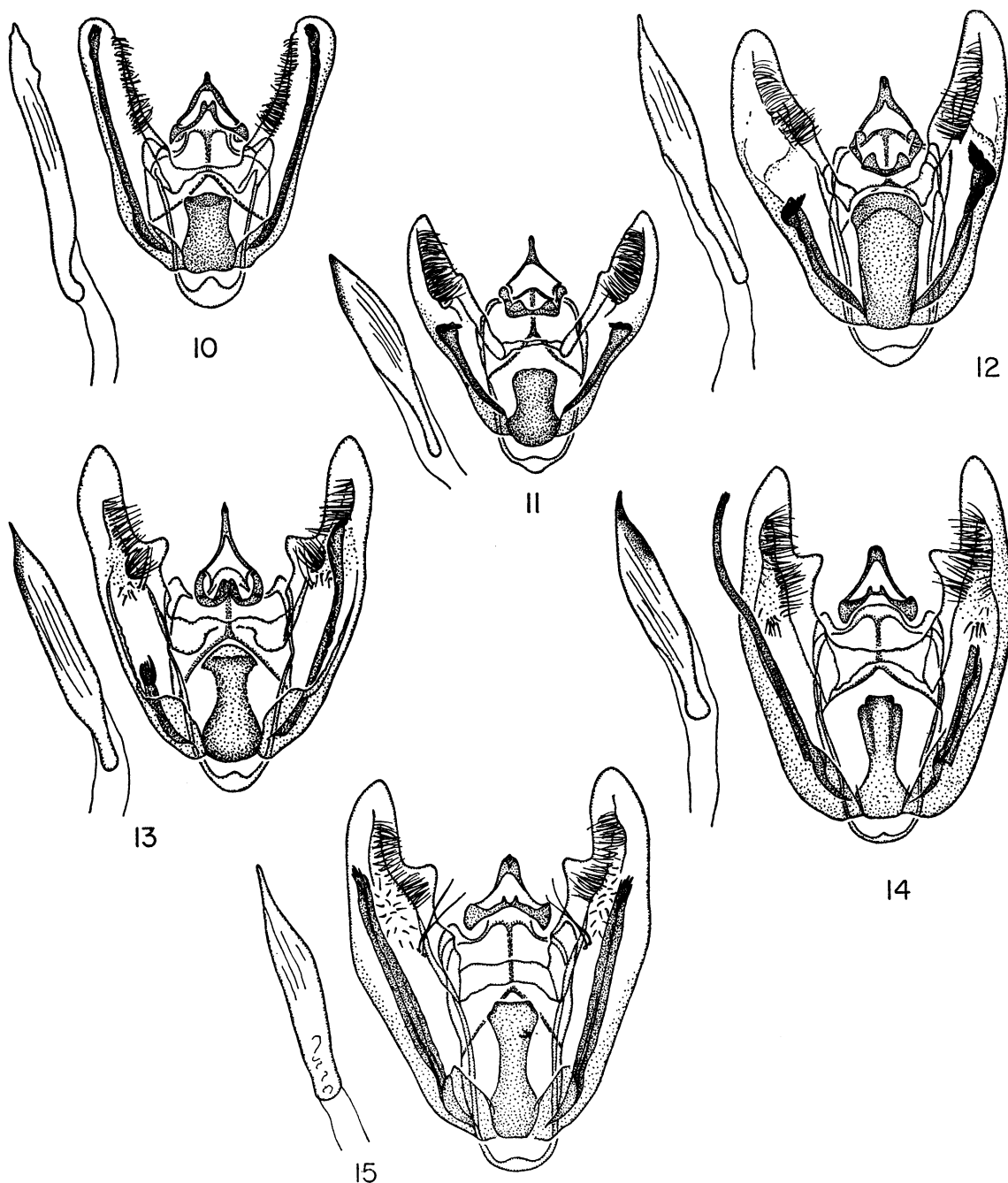
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| 6. <i>gaviota</i> (Dognin) | Colombia, Ecuador, Peru, Bolivia |
| 7. <i>lima</i> , new species | Ecuador, Bolivia |
| 8. <i>subsimilis</i> Dognin | Venezuela, Colombia, Ecuador, Peru, Bolivia |
| 9. <i>ultrasimilis</i> , new species | Peru, Bolivia |
| 10. <i>lunata</i> , new species | Colombia |
| 11. <i>subjecta</i> W. Warren | Peru, Bolivia |
| 12a. <i>malinaria malinaria</i> Schaus | Mexico, Guatemala, Costa Rica |
| b. <i>malinaria minuisca</i> , new subspecies | Panama |
| 13. <i>supplanaria</i> (Dyar) | Mexico, Costa Rica |
| 14. <i>falcis</i> , new species | Mexico |
| 15. <i>hamata</i> , new species | Mexico |
| 16. <i>funnebris</i> (Schaus) | Costa Rica |
| 17. <i>caeca</i> , new species | Mexico, Guatemala, Costa Rica, Panama |
| 18. <i>alterata</i> W. Warren | Costa Rica, Panama, Colombia |
| 19. <i>bifurca</i> , new species | Guatemala |

Melanotesia, NEW GENUS

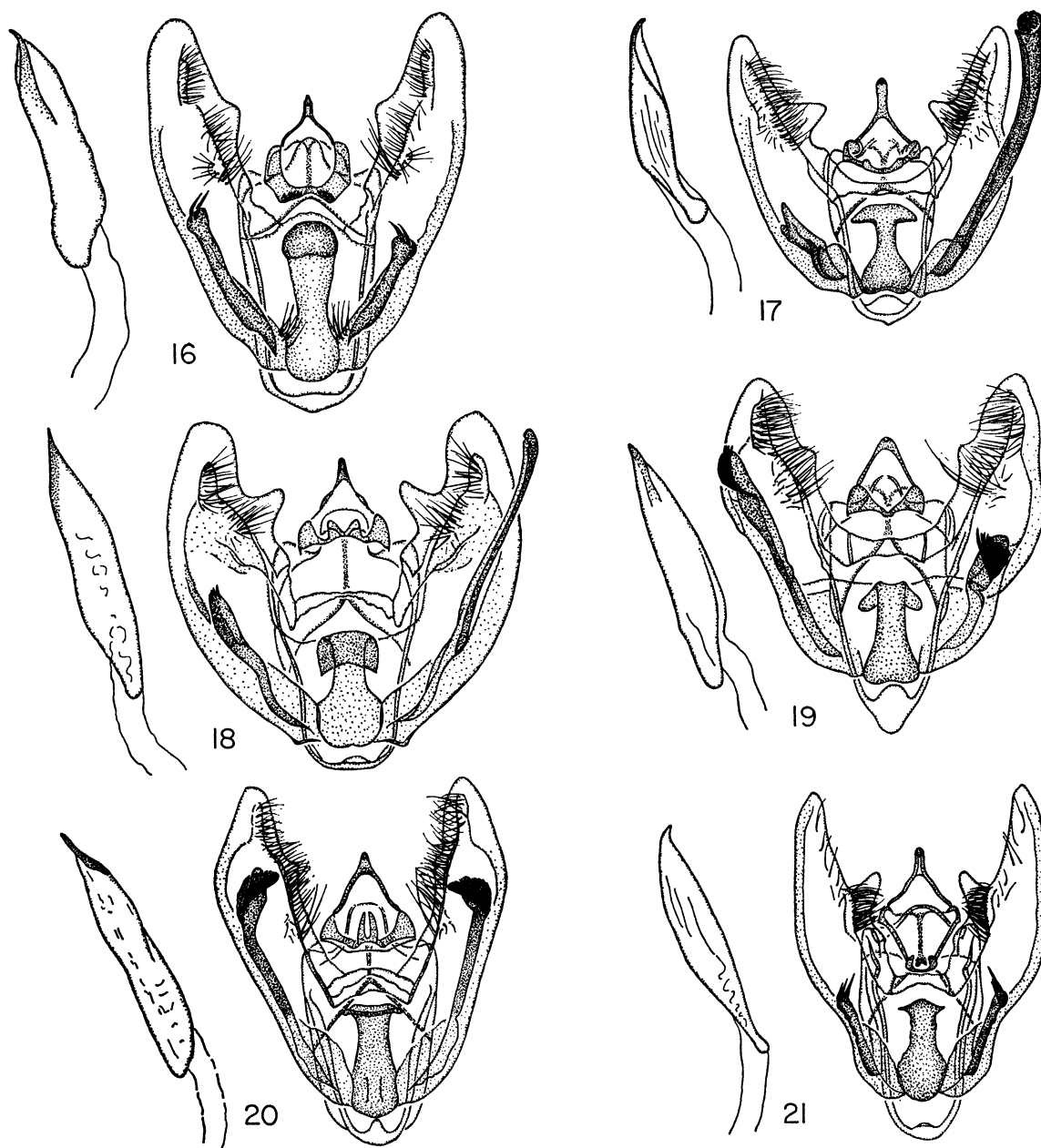
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|-----------------------------|---------------|
| 1. <i>siderata</i> (Dognin) | Bolivia, Peru |
| 2. <i>intensa</i> (Dognin) | Colombia |



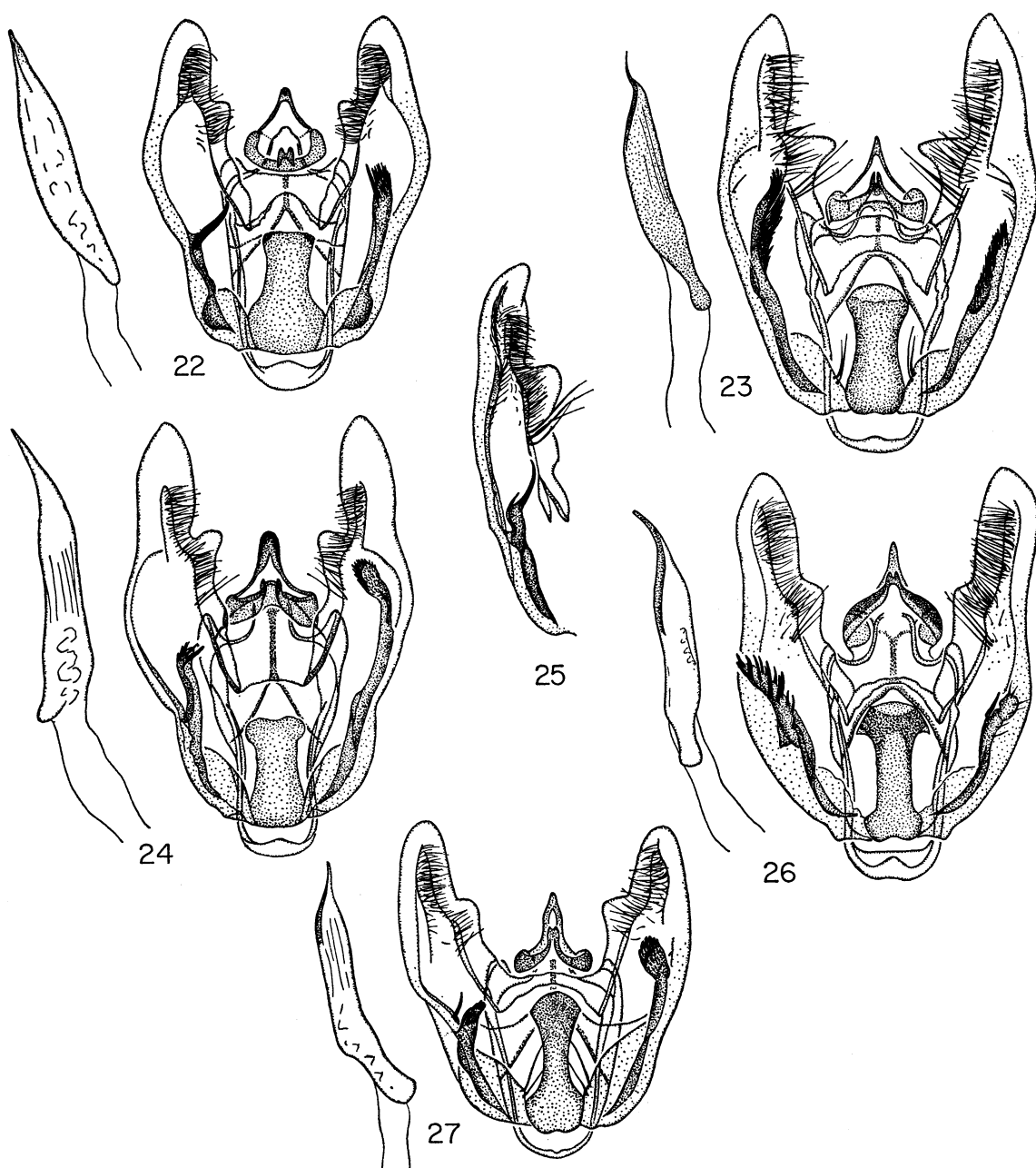
FIGS. 5-9. Male genitalia. 5. *Melanolophia delinquaria* (Walker), Nuevo Teutonia, Brazil, December 18, 1952 (Plaumann; A.M.N.H.). 6. *M. modica*, new species, paratype, San Juan, Argentina, November 6, 1951 (J. Foerster; A.M.N.H.). 7. *M. apicalis* (W. Warren), Pelotas, Rio Grande do Sul, Brazil, November 14, 1954 (C. Biezanko; A.M.N.H.). 8. *M. vitta*, new species, holotype, Petropolis, Brazil (B.M.N.H.). 9. *M. praeapicata* (W. Warren), Nuevo Teutonia, Brazil, July 5, 1951 (Plaumann; A.M.N.H.).



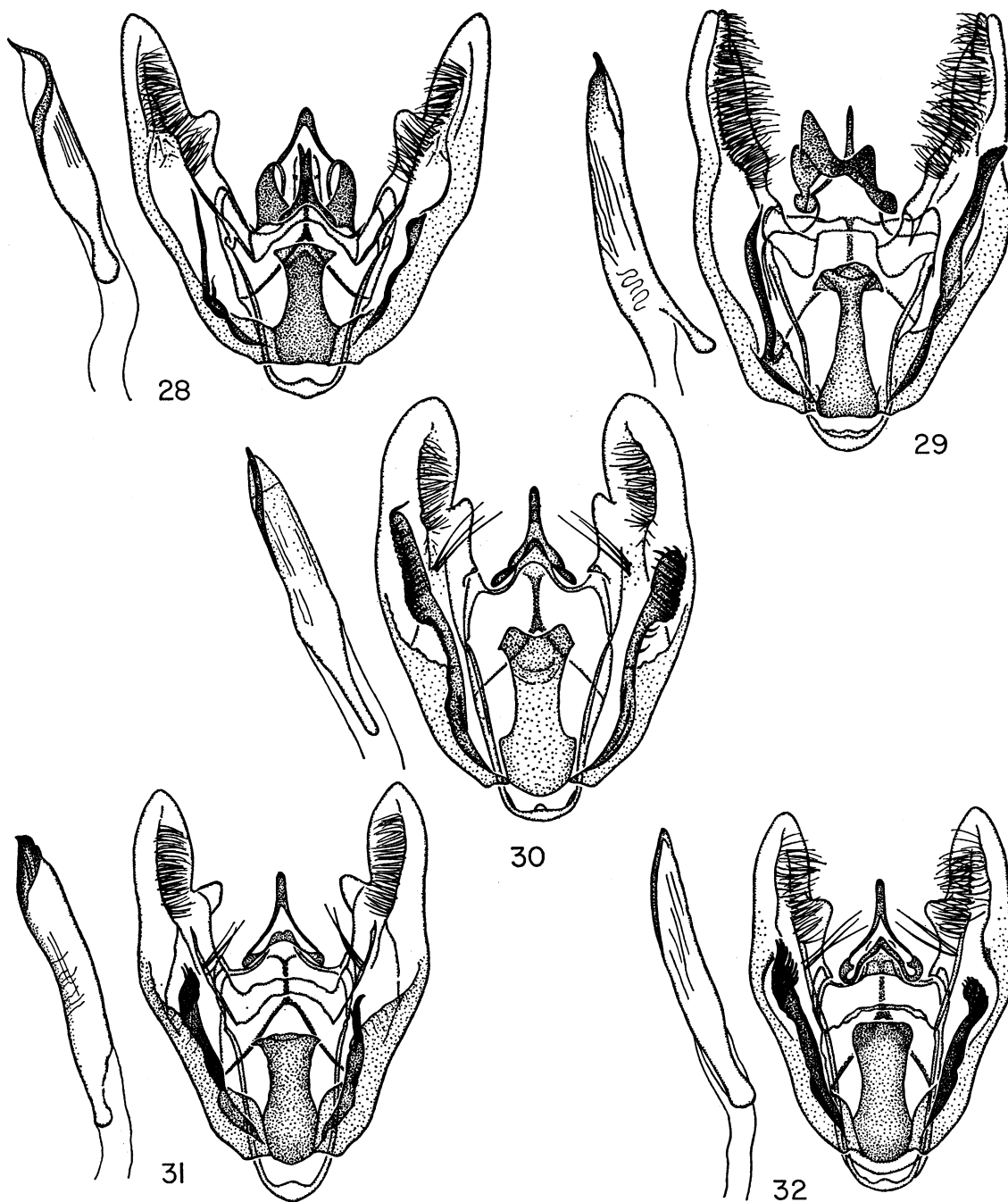
FIGS. 10-15. Male genitalia. 10. *Melanolophia centosa* (Schaus), Castro, Paraná, Brazil (E. D. Jones; B.M.N.H.). 11. *M. striata* (W. Warren), Callanga, Paucartambo, Cuzco, Peru, February 16, 1953 (F. L. Woytkowski; A.M.N.H.). 12. *M. substriata*, new species, paratype, "Ob. Rio Negro, Ost. Colombia" (Fassl; B.M.N.H.). 13. *M. subatrata* (Dognin), Nuevo Teutonia, Brazil, April, 1953 (Plaumann; A.M.N.H.). 14. *M. inatrata*, new species, paratype, Chapare, Bolivia, May 30, 1949 (A.M.N.H.). 15. *M. conspicua* Schaus, Tuis, Costa Rica, May (Schaus and Barnes; U.S.N.M.).



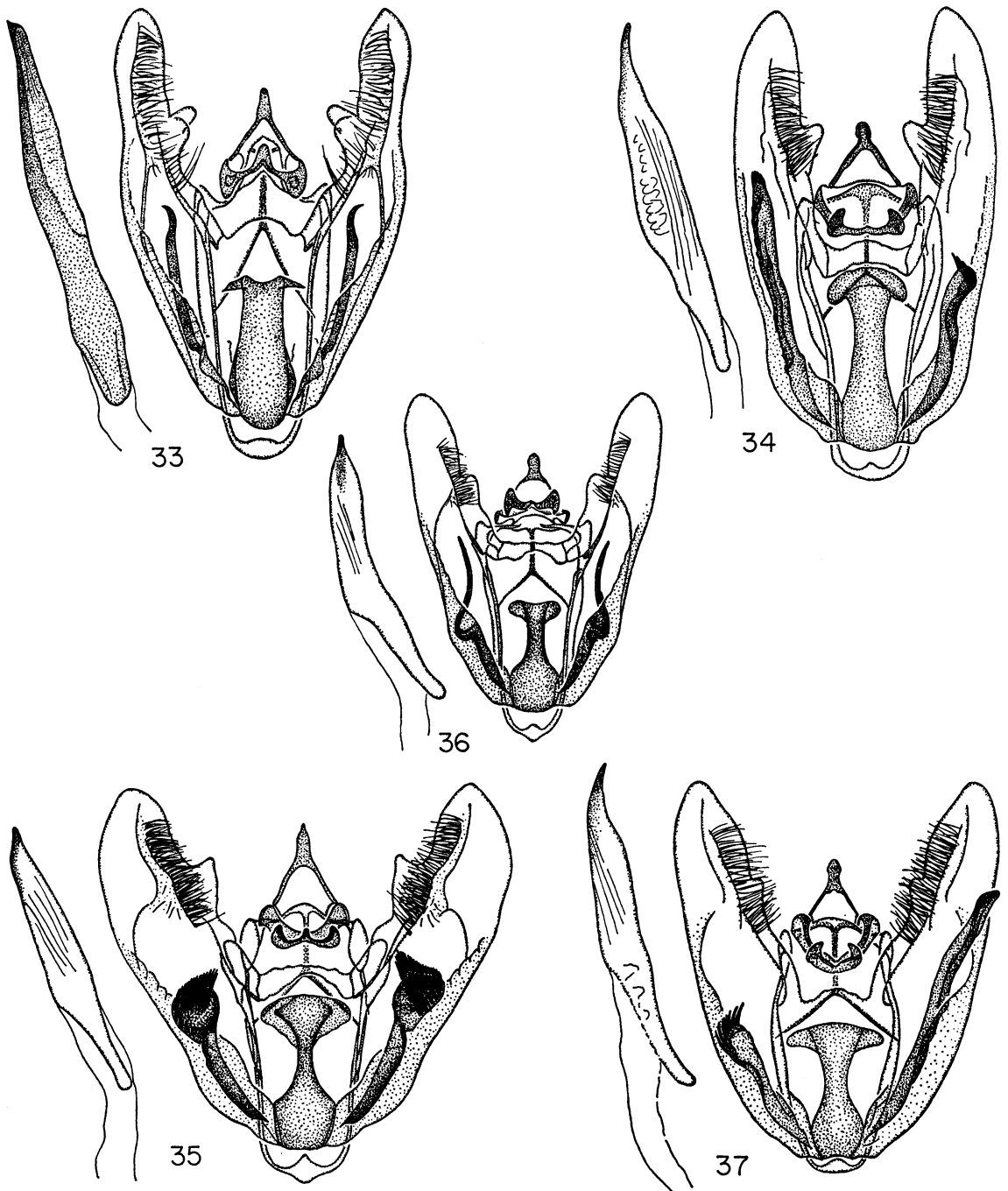
FIGS. 16-21. Male genitalia. 16. *Melanolophia umbrosa*, new species, paratype, Region Chapare Bolivia, June, 1951 (A.M.N.H.). 17. *M. tenebrosa* (W. Warren), Tucuman, Argentina (R. Schreiter; B.M.N.H.). 18. *M. muscitincta* (W. Warren), Coosnipata, Paucartambo, Cuzco, Peru, November 23, 1951 (F. L. Woytkowski; A.M.N.H.). 19. *M. piura*, new species, holotype, Huancabamba, Peru (U.S.N.M.). 20. *M. producta*, new species, holotype, Balzapamba, Bolivar, Ecuador, March-April, 1894 (M. de Mathan; B.M.N.H.). 21. *M. limosa* (Dognin), cotype, "Environs de Loja," Ecuador, 1891 (U.S.N.M.).



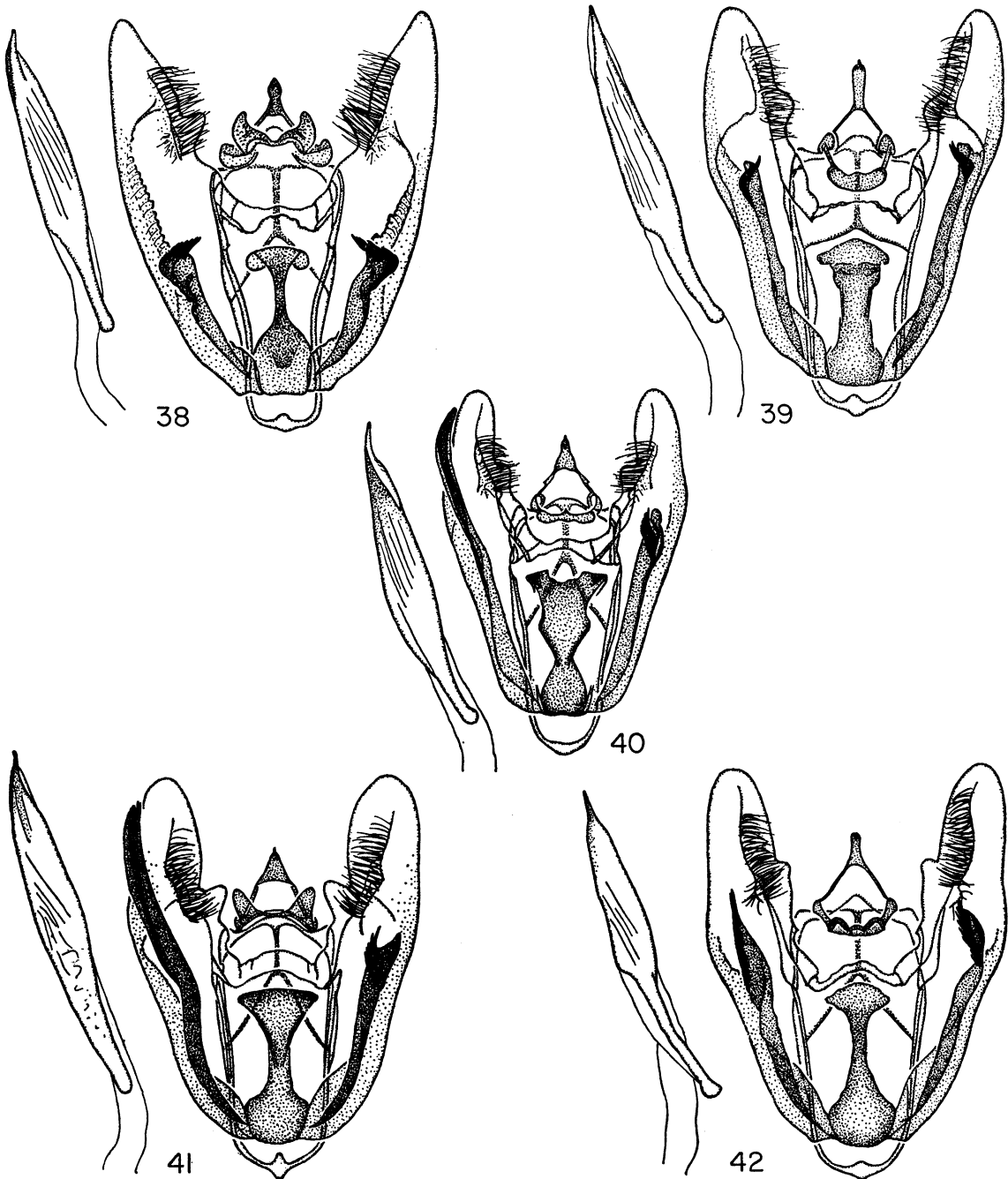
FIGS. 22-27. Male genitalia. 22. *Melanolophia accurata* Prout, San Antonio, Colombia, February, 1909 (Fassl; U.S.N.M.). 23. *M. eudoxa eudoxa*, new subspecies, paratype, Chapare, Bolivia, August 23, 1949 (Peña; A.M.N.H.). 24. *M. trisurca elongata*, new subspecies, paratype, Huancabamba, Peru (U.S.N.M.). 25. *M. trisurca trisurca* (Dognin), "Environs de Loja," Ecuador, 1891 (U.S.N.M.), left valve. 26. *M. munda* (W. Warren), paratype, Cushi, Huánuco, Peru (W. Hoffmanns; B.M.N.H.). 27. *M. vegranda*, new species, paratype, Cachi, Costa Rica (Lankester; B.M.N.H.).



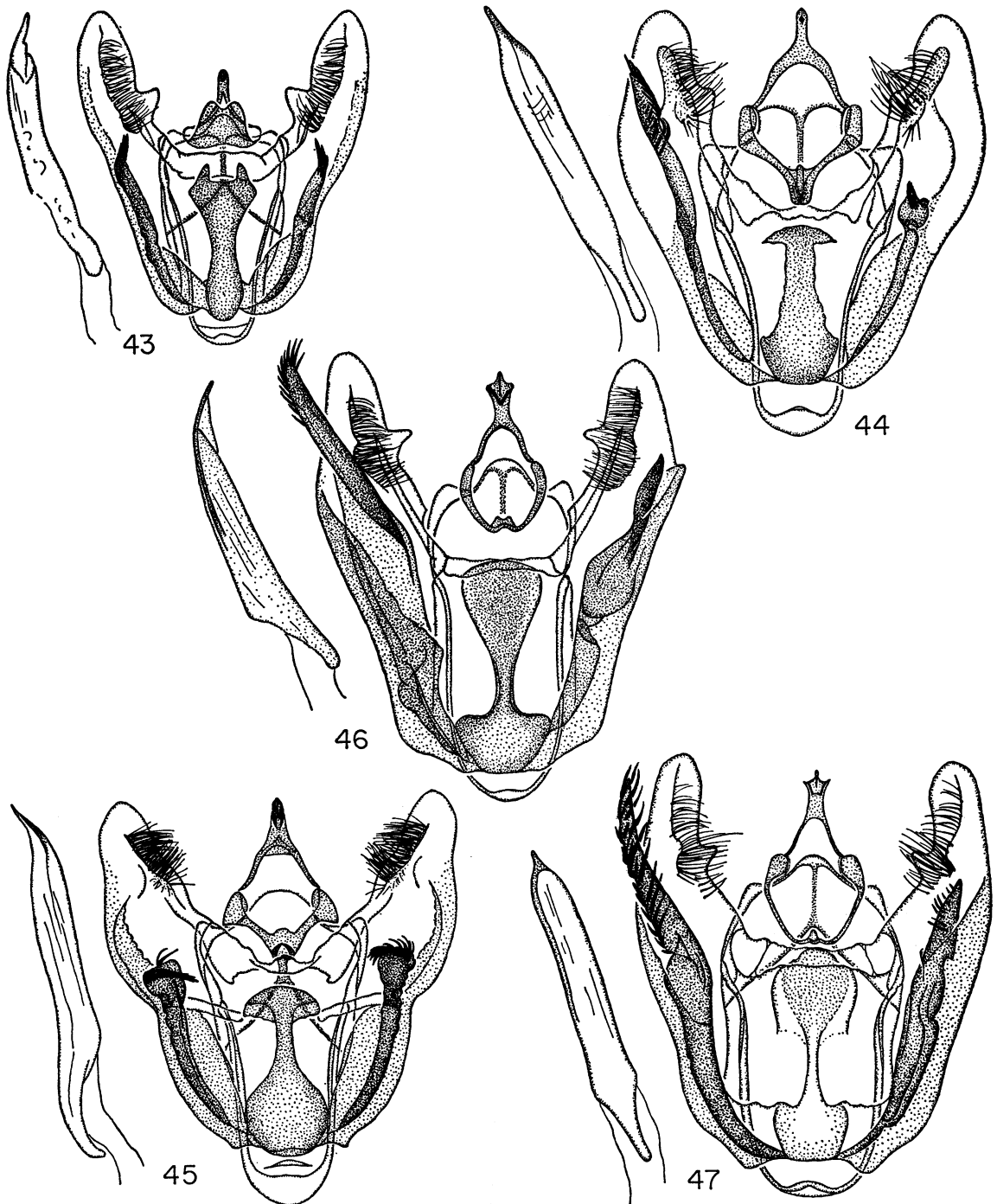
FIGS. 28-32. Male genitalia. 28. *Melanolophia perversa*, new species, paratype, Nuevo Teutonia, Brazil, August 13, 1950 (Plaumann; A.M.N.H.). 29. *M. triloba*, new species, holotype, Jalapa, Mexico (Schaus; A.M.N.H.). 30. *M. penicilla*, new species, paratype, Satipo, Peru, February, 1941 (A.M.N.H.). 31. *M. atrifascia*, new species, paratype, Barro Colorado, Canal Zone, March 19, 1936 (Gertsch, Lutz, Wood; A.M.N.H.). 32. *M. homofascia*, new species, holotype, San Esteban, Venezuela, July, 1909 (S. M. Klages; B.M.N.H.).



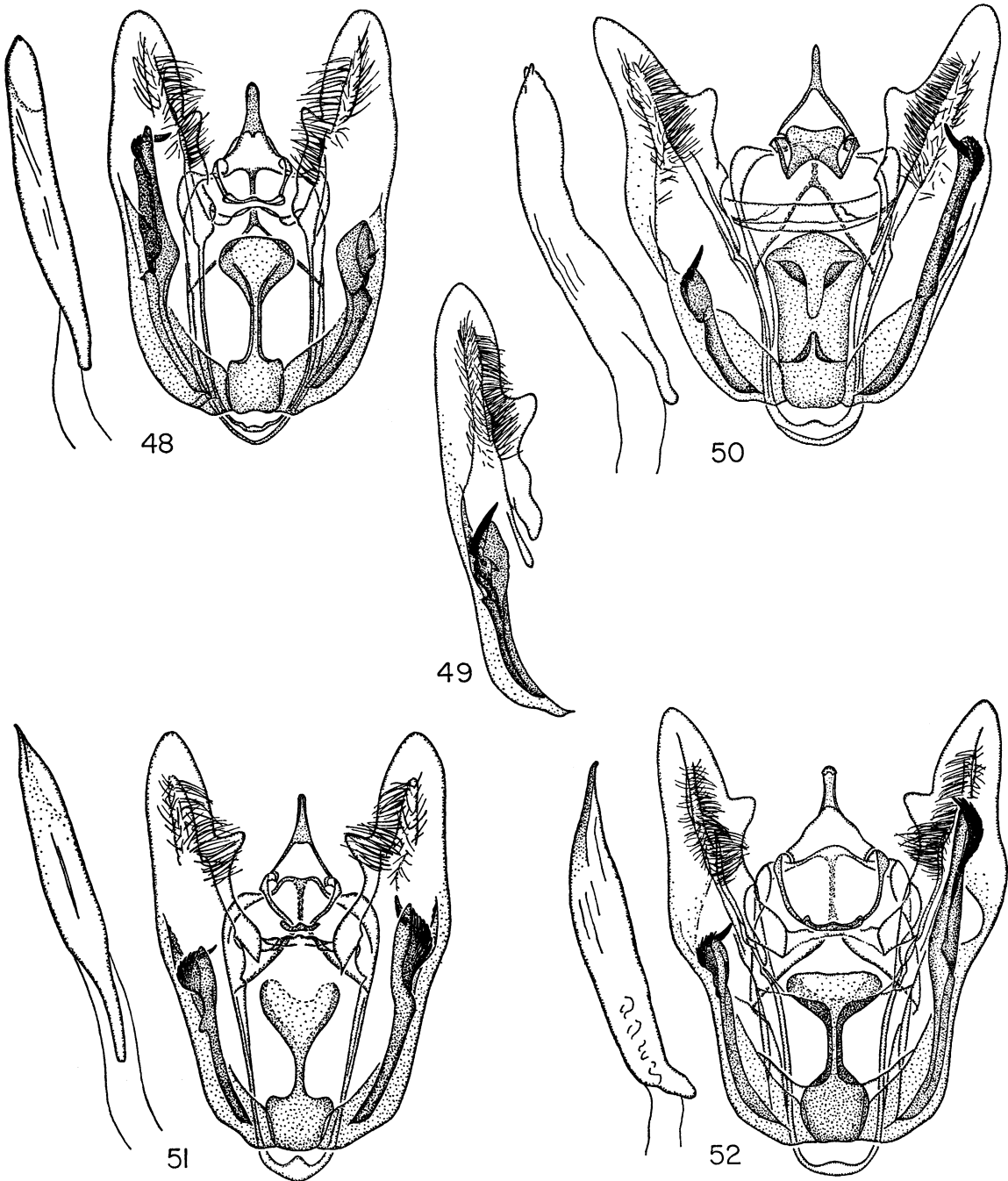
FIGS. 33-37. Male genitalia. 33. *Melanolophia sadrina sadrina* (Schaus), La Mercedes, Guatemala (Champion; B.M.N.H.). 34. *M. sadrinaria*, new species, holotype, San José, Costa Rica (U.S.N.M.). 35. *M. imitata imitata* (Walker), San Mateo County, California, May 7 (A.M.N.H.). 36. *M. centralis* McDunnough, Glenwood Springs, Colorado (A.M.N.H.). 37. *M. bostar* (Druce), Coatepec, Mexico (U.S.N.M.).



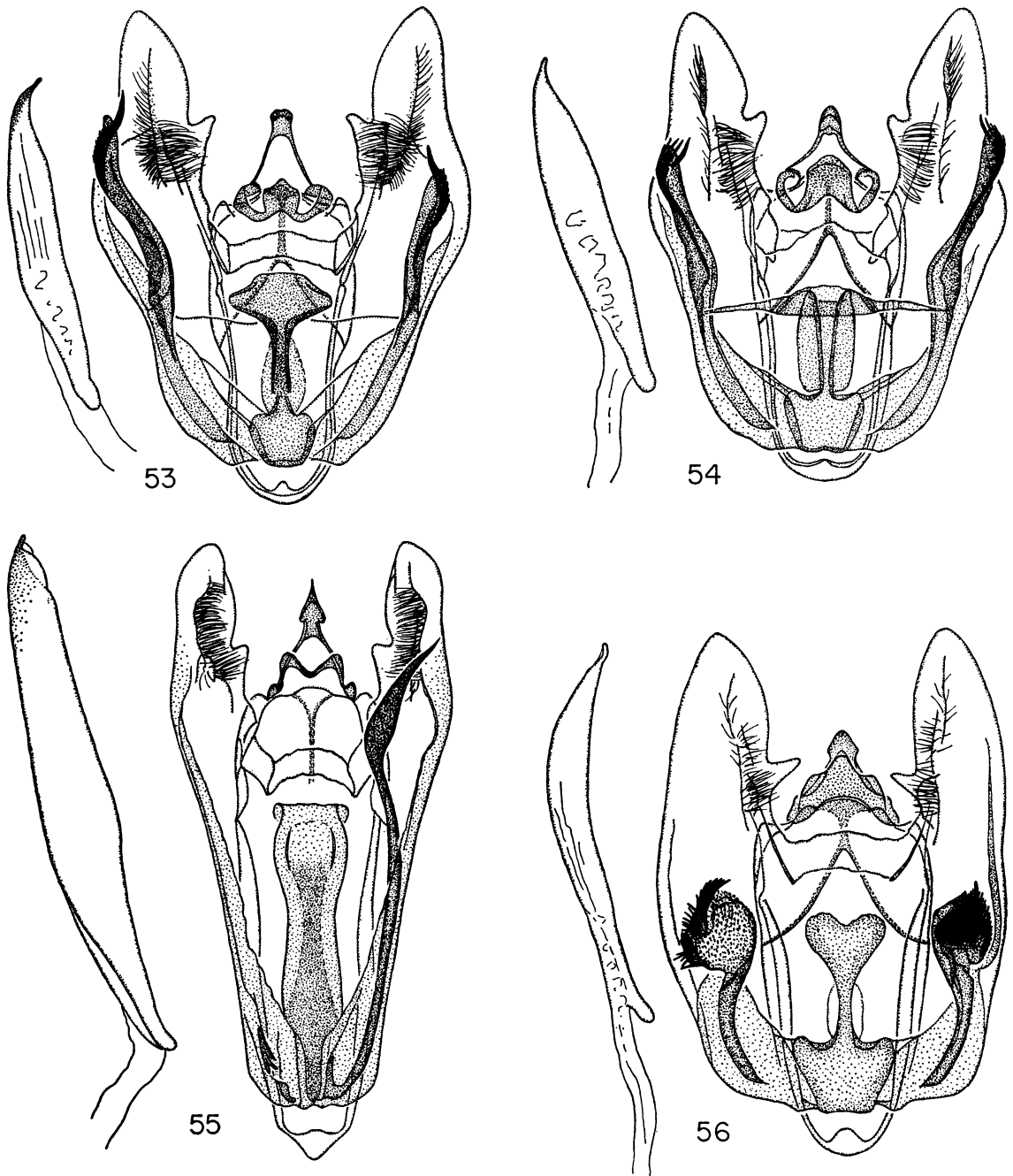
FIGS. 38-42. Male genitalia. 38. *Melanolophia flexilinea flexilinea* (W. Warren), Jalapa, Mexico (Schaus; A.M.N.H.). 39. *M. canadaria crama*, new subspecies, New Canaan, Connecticut, April 29, 1951 (M. Statham; A.M.N.H.). 40. *M. signataria signataria* (Walker), New Canaan, Connecticut, May 1, 1951 (M. Statham; A.M.N.H.). 41. *M. imperfectaria imperfectaria* (Walker), Brownsville, Texas, March 8 (A.M.N.H.). 42. *M. fimbriata*, new species, holotype, El Volcan, Chiriqui, Panama, February 17, 1936 (Lutz and Gertsch; A.M.N.H.).



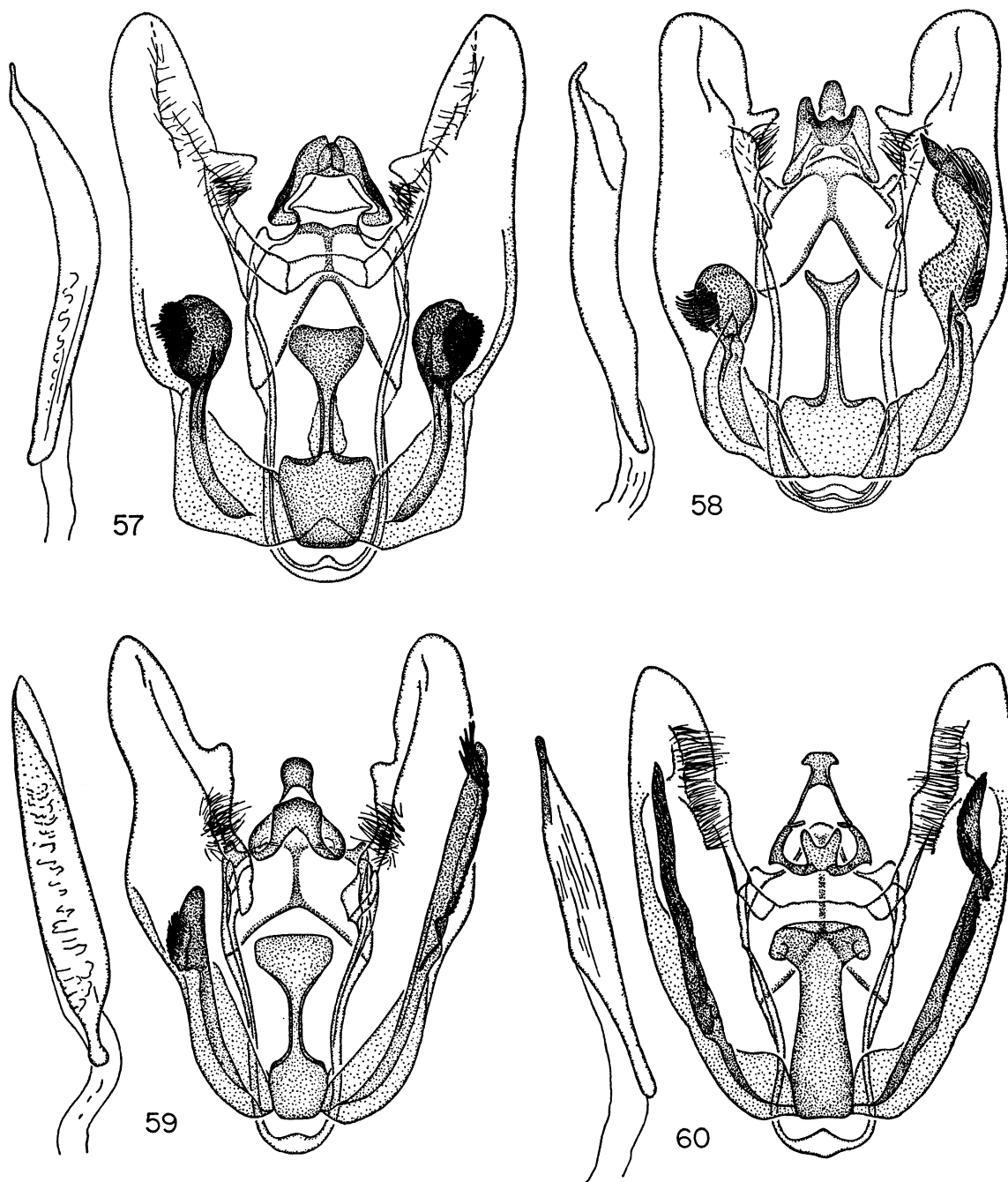
FIGS. 43-47. Male genitalia. 43. *Melanolophia parma*, new species, holotype, Tuis, Costa Rica, June, 1907 (U.S.N.M.). 44. *M. orthotis* Prout, Region Chapare, Bolivia, August, 1950 (A.M.N.H.). 45. *M. divergens* (W. Warren), St. Laurent du Maroni, French Guiana (U.S.N.M.). 46. *M. intervallata* (W. Warren), El Volcan, Chiriqui, Panama, February 18, 1936 (Lutz and Gertsch; A.M.N.H.). 47. *M. pseudo-vallata*, new species, holotype, Chapare, Bolivia, August 28, 1949 (Peña; A.M.N.H.).



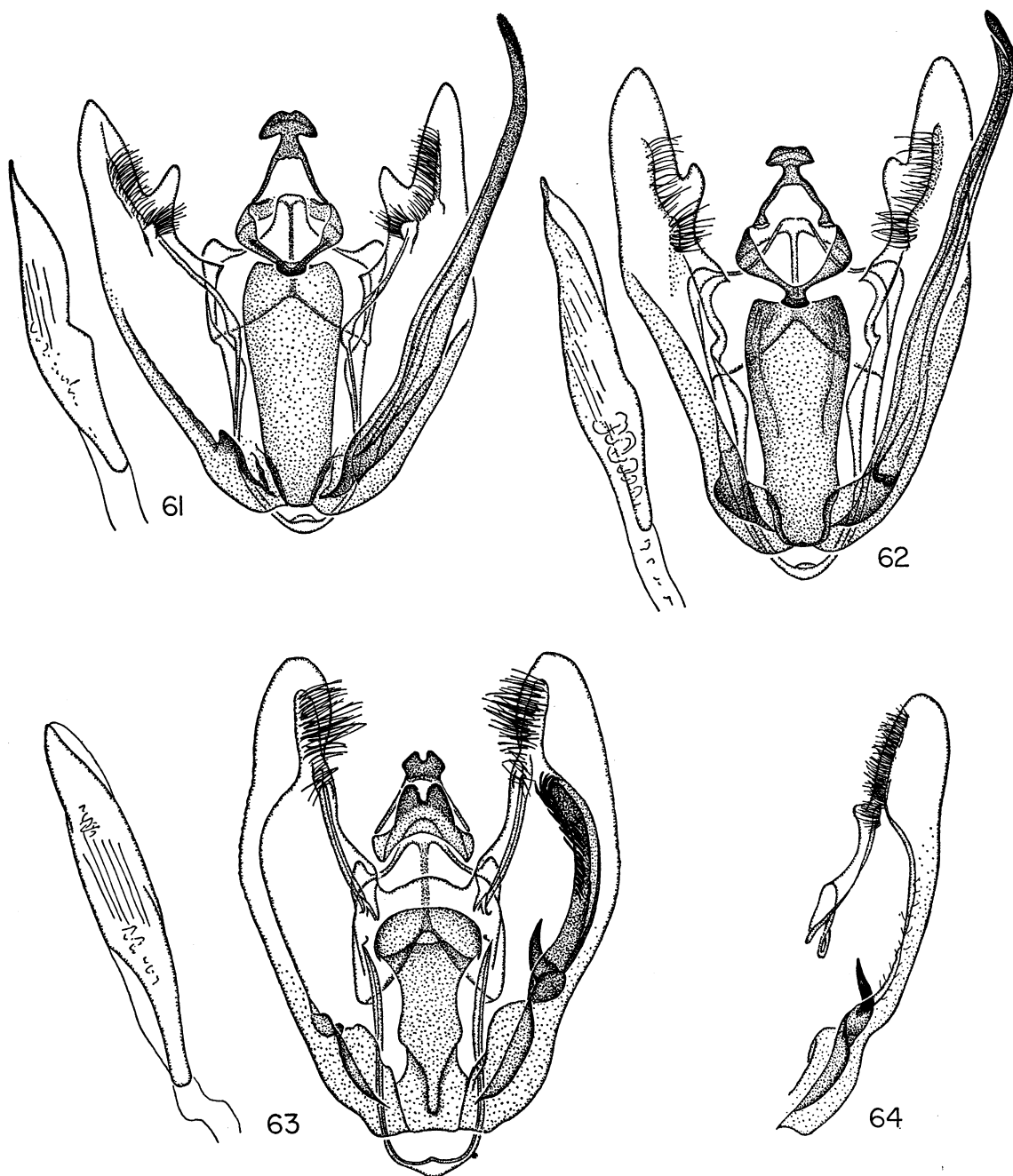
FIGS. 48-52. Male genitalia. 48. *Melanolophia reducta meridiana*, new subspecies, paratype, Callanga, Cuzco, Peru, February 16, 1950 (F. L. Woytkowski; A.M.N.H.). 49. *M. reducta borea*, new subspecies, holotype, Cañon del Tolima, Colombia, December, 1909 (A. H. Fassl; B.M.N.H.), left valve. 50. *M. corza* (Dognin), "Environs de Loja," Ecuador, 1891 (U.S.N.M.). 51. *M. reductaria*, new species, paratype, Yungas del Palmar, Bolivia, February 10, 1948 (A.M.N.H.). 52. *M. dextera*, new species, paratype, Sierra del Libane, Colombia (H. H. Smith; B.M.N.H.).



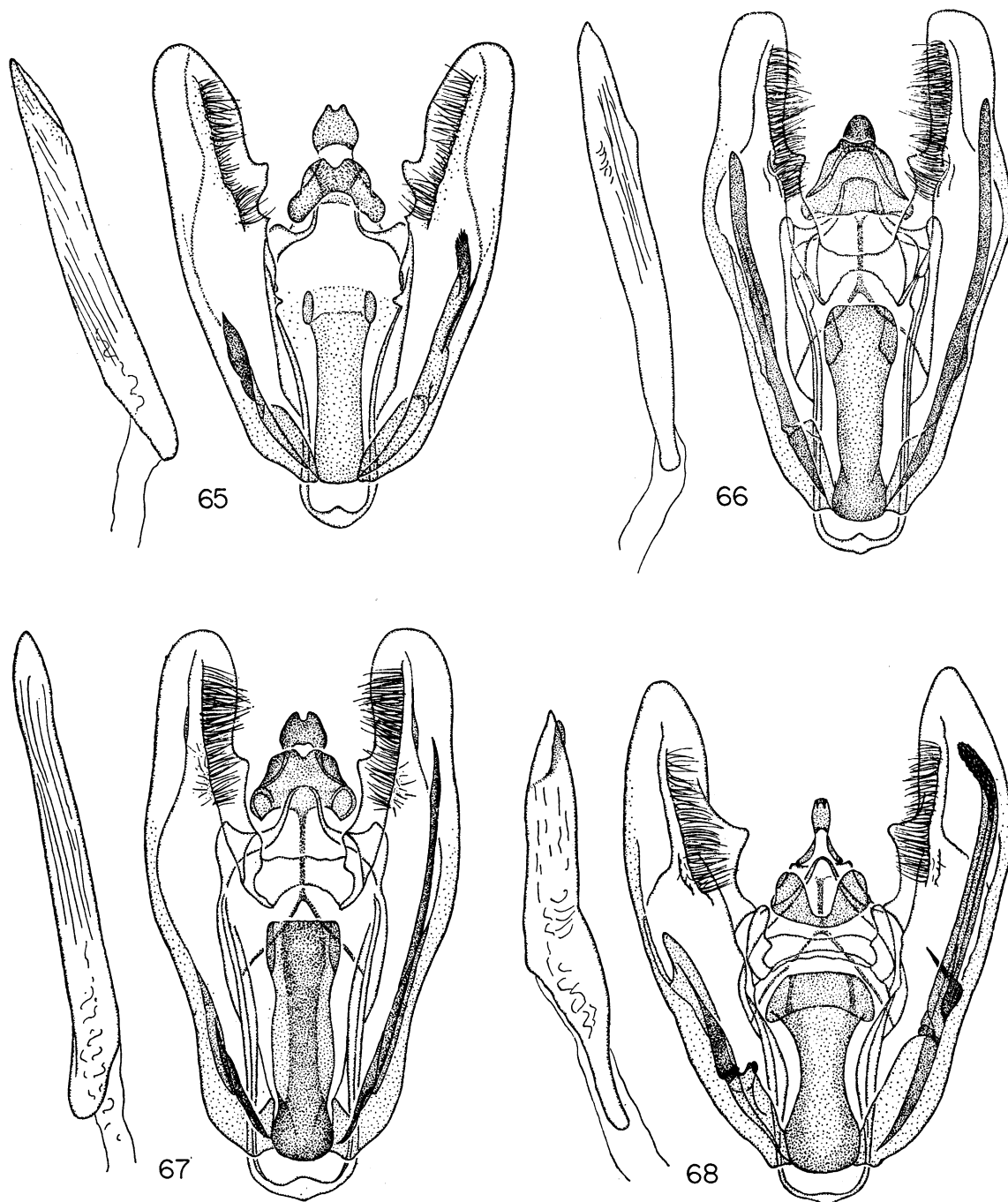
FIGS. 53-56. Male genitalia. 53. *Melanolophia isoforma*, new species, holotype, Monte Tolima, Colombia, February, 1910 (A. H. Fassl; B.M.N.H.). 54. *M. isometra*, new species, holotype, "Envi-
rons de Loja," Ecuador, 1891 (U.S.N.M.). 55. *M. attenuata*, new species, paratype, Chiriqui, Panama
(B.M.N.H.). 56. *M. argilaria* (Guenée), no data (B.M.N.H.)



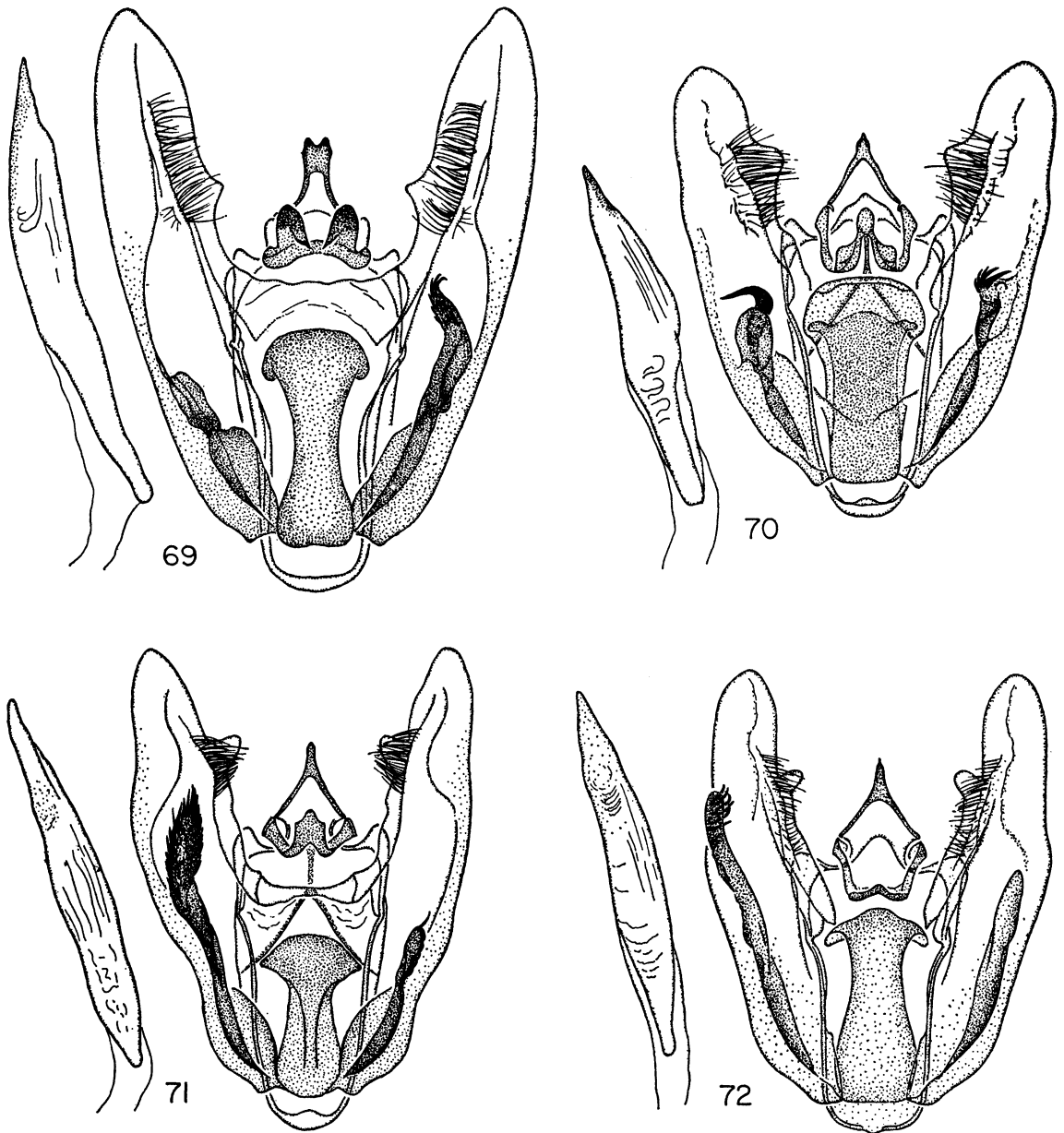
FIGS. 57-60. Male genitalia. 57. *Melanolopia synargilaria*, new species, holotype, Chachapoyas, Amazonas, Peru, 1889 (M. de Mathan; B.M.N.H.). 58. *M. commotaria* (Maassen), San Antonio, Colombia, November, 1907 (M. G. Palmer; A.M.N.H.). 59. *M. dislocata* (W. Warren), Huancabamba, Peru (A.M.N.H.). 60. *M. mutabilis* (W. Warren), near Troy, Jamaica, May 12-25, 1909 (A.M.N.H.).



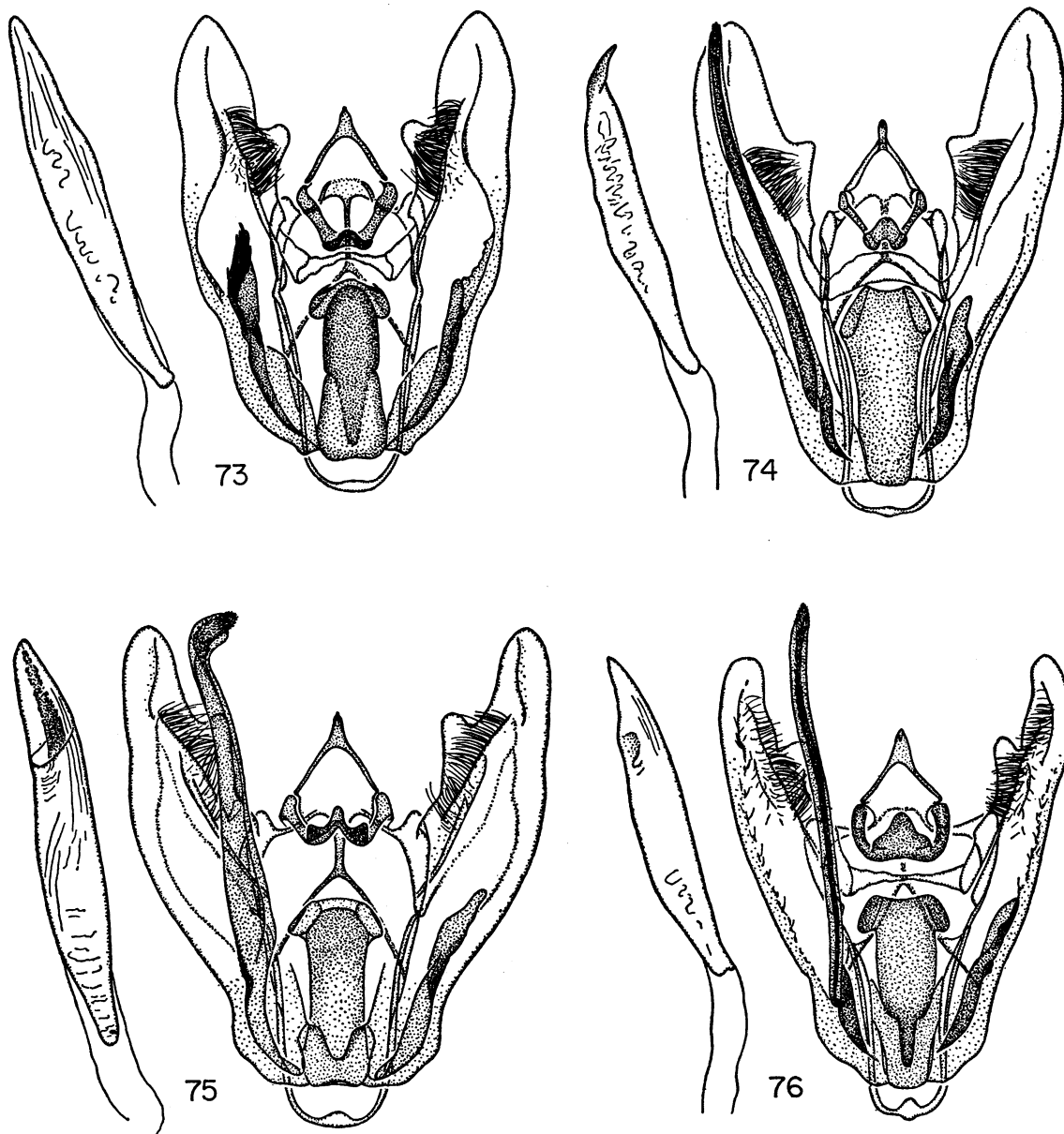
FIGS. 61-64. Male genitalia. 61. *Melanolophia elegia*, new species, paratype, Vista Hermosa, Oaxaca, Mexico, October 16, 1962 (E. C. Welling; A.M.N.H.). 62. *M. mallea*, new species, paratype, Chanchamayo, Peru (A.M.N.H.). 63. *M. bugnathos bugnathos*, new subspecies, holotype, Yungas del Palmar, Bolivia, April 10, 1950 (A.M.N.H.). 64. *M. bugnathos contracta*, new subspecies, holotype, Balzapamba, Bolivar, Ecuador, September, 1893, to February, 1894 (M. de Mathan; B.M.N.H.), right valve.



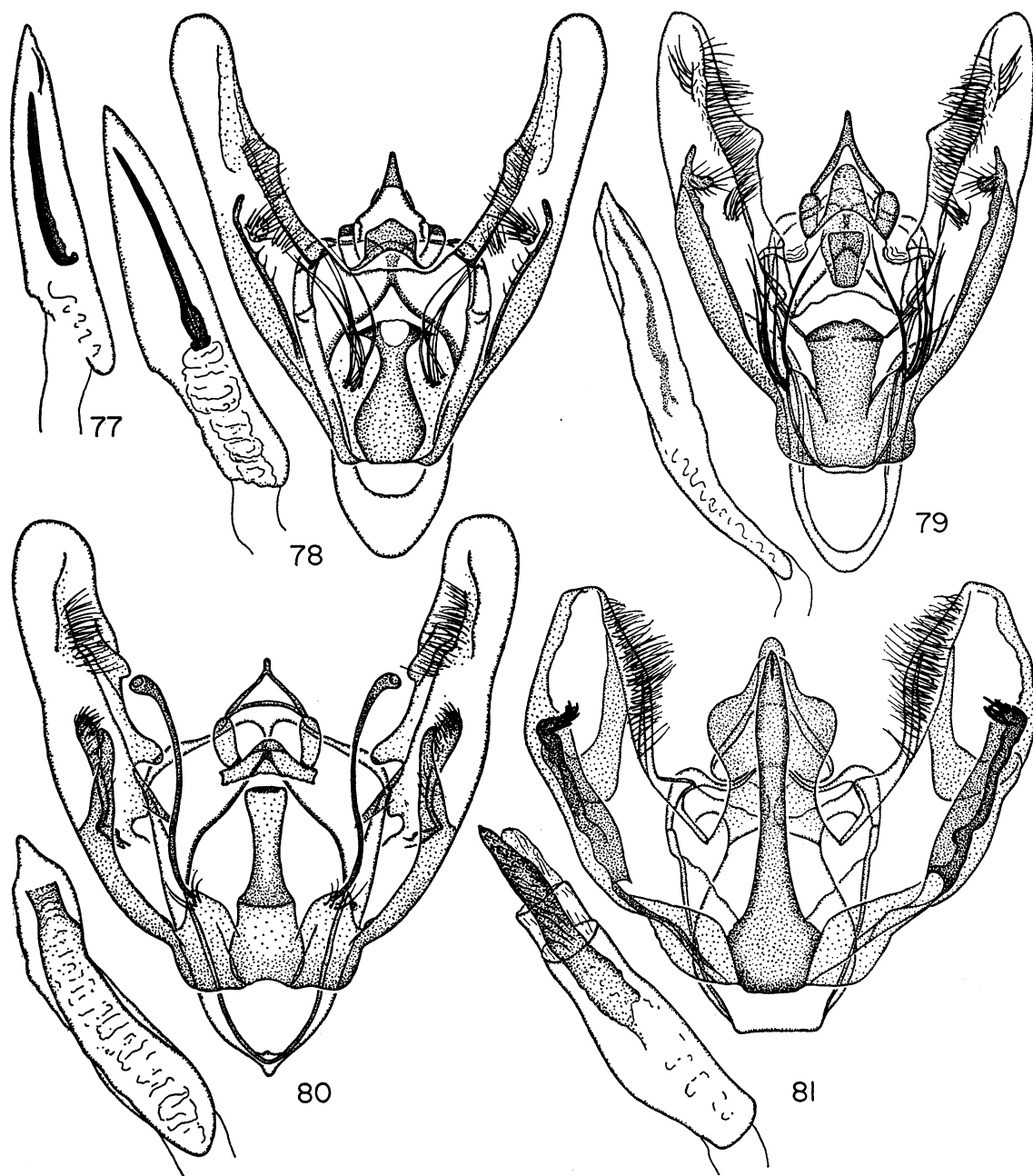
FIGS. 65-68. Male genitalia. 65. *Melanolophia spatiosata* (Dognin), Chapare, Bolivia, August 28, 1949 (Peña; A.M.N.H.). 66. *M. conta*, new species, holotype, Chanchamayo, Peru (O. Schuncke; B.M.N.H.). 67. *M. minca*, new species, paratype, Minca, Colombia (H. H. Smith; B.M.N.H.). 68. *M. rima*, new species, holotype, Muzo, Colombia, May, 1915 (U.S.N.M.).



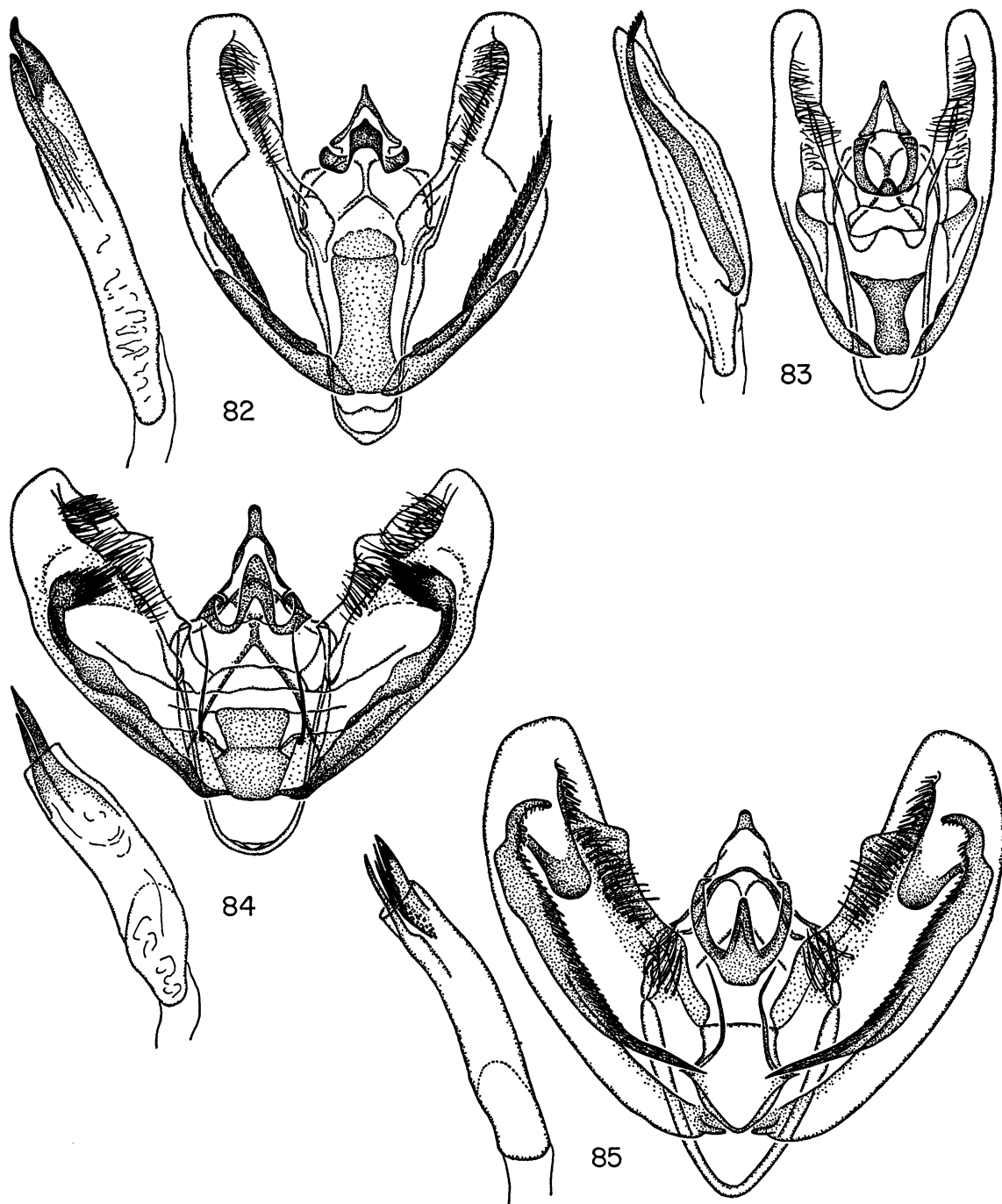
FIGS. 69-72. Male genitalia. 69. *Melanolophia eucheria* Schaus, Alto da Serra, Santos, Brazil, March, 1913 (E. D. Jones; B.M.N.H.). 70. *M. consimiliaria* (Walker), Nuevo Teutonia, Brazil, January 18, 1953 (Plaumann; A.M.N.H.). 71. *M. immacata* (Schaus), Yunga del Espiritu Santo, Cochabamba, Bolivia, 1888-1889 (P. Germain; B.M.N.H.). 72. *M. semarcata*, new species, holotype, La Merced, Peru, September 9, 1951 (Rivas; A.M.N.H.).



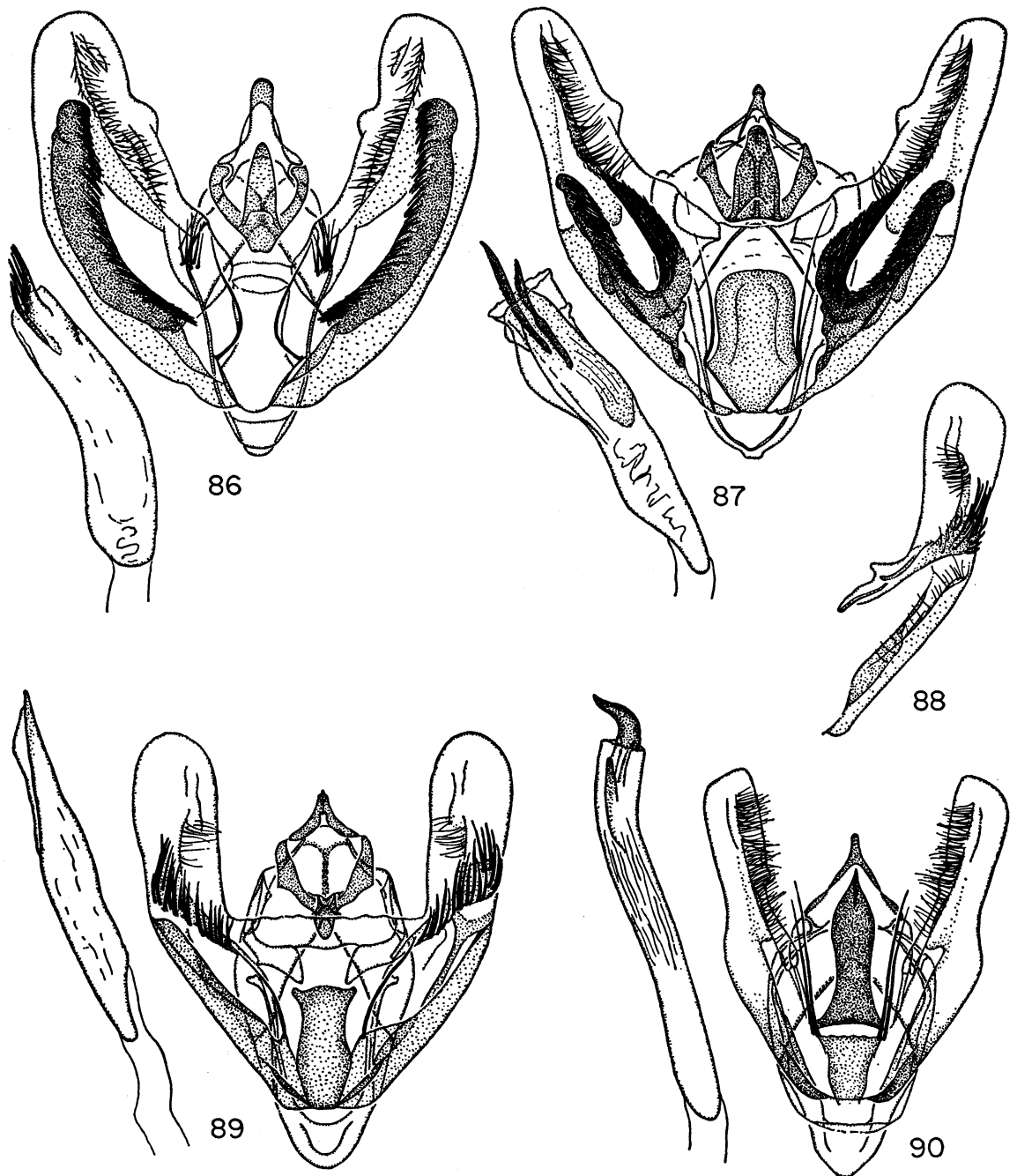
FIGS. 73-76. Male genitalia. 73. *Melanolophia agnataria* (Snellen), "Ob. Rio Negro, Ost Colombia" (Fassl; B.M.N.H.). 74. *M. muscosa* (W. Warren), "Environs de Loja," Ecuador, 1891 (U.S.N.M.). 75. *M. paraconara*, new species, paratype, Colombia (A.M.N.H.). 76. *M. orthoconara*, new species, holotype, Lino, Panama (Fassl; U.S.N.M.).



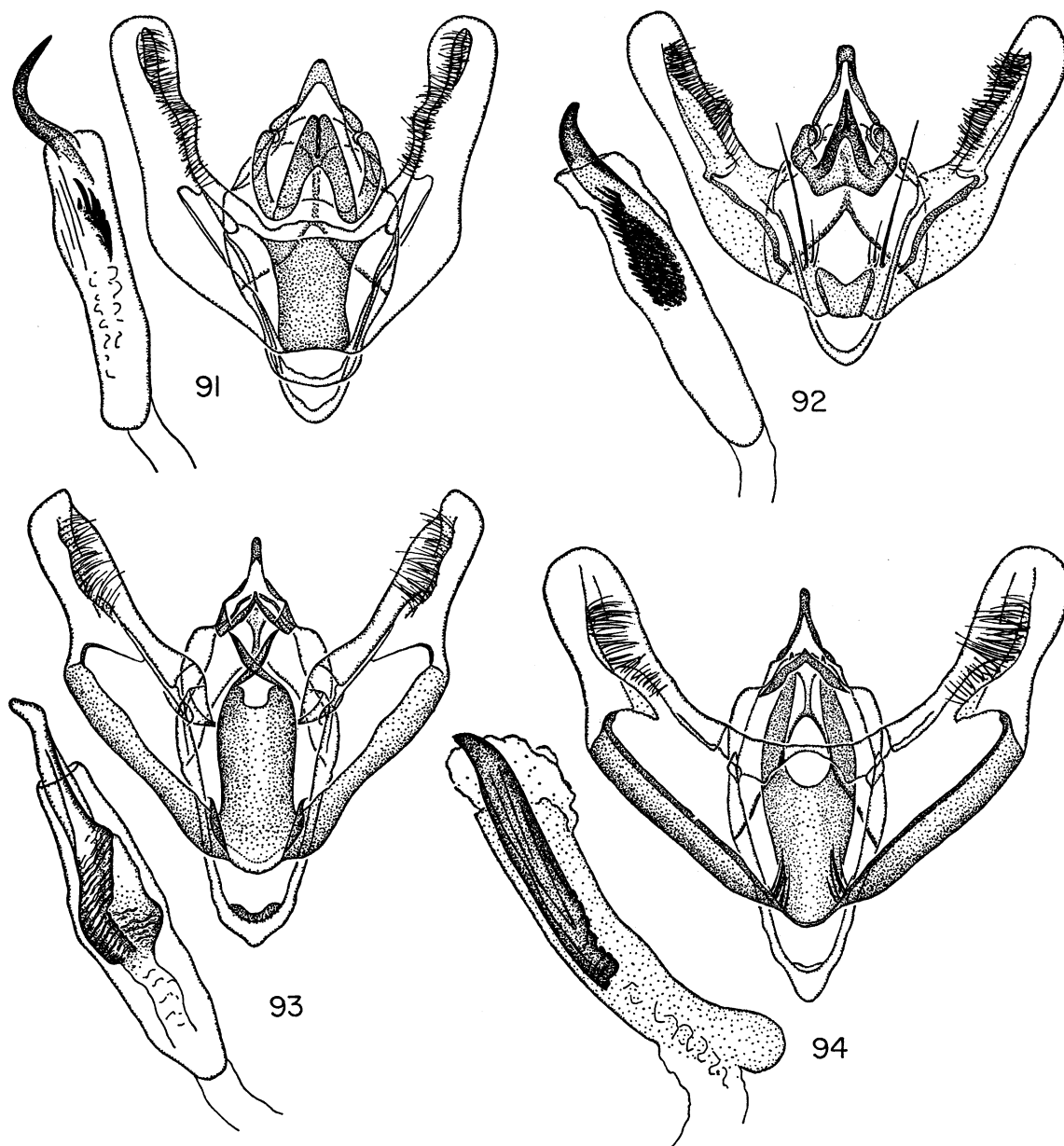
FIGS. 77-81. Male genitalia. 77. *Pherotesia condensaria* (Guenée), Nuevo Teutonia, Brazil, November 19, 1952 (Plaumann; A.M.N.H.), aedeagus. 78. *P. confusata* (Walker), Santa Catarina, Brazil (A.M.N.H.). 79. *P. simulatrix*, new species, holotype, Yuntas, near Cali, Colombia (U.S.N.M.). 80. *P. potens* W. Warren, La Merced, Peru, August 29, 1951 (Rivas; A.M.N.H.). 81. *P. liciata* Dognin, Cerro de Pasco, Huancabamba, Peru (E. Boettger; B.M.N.H.).



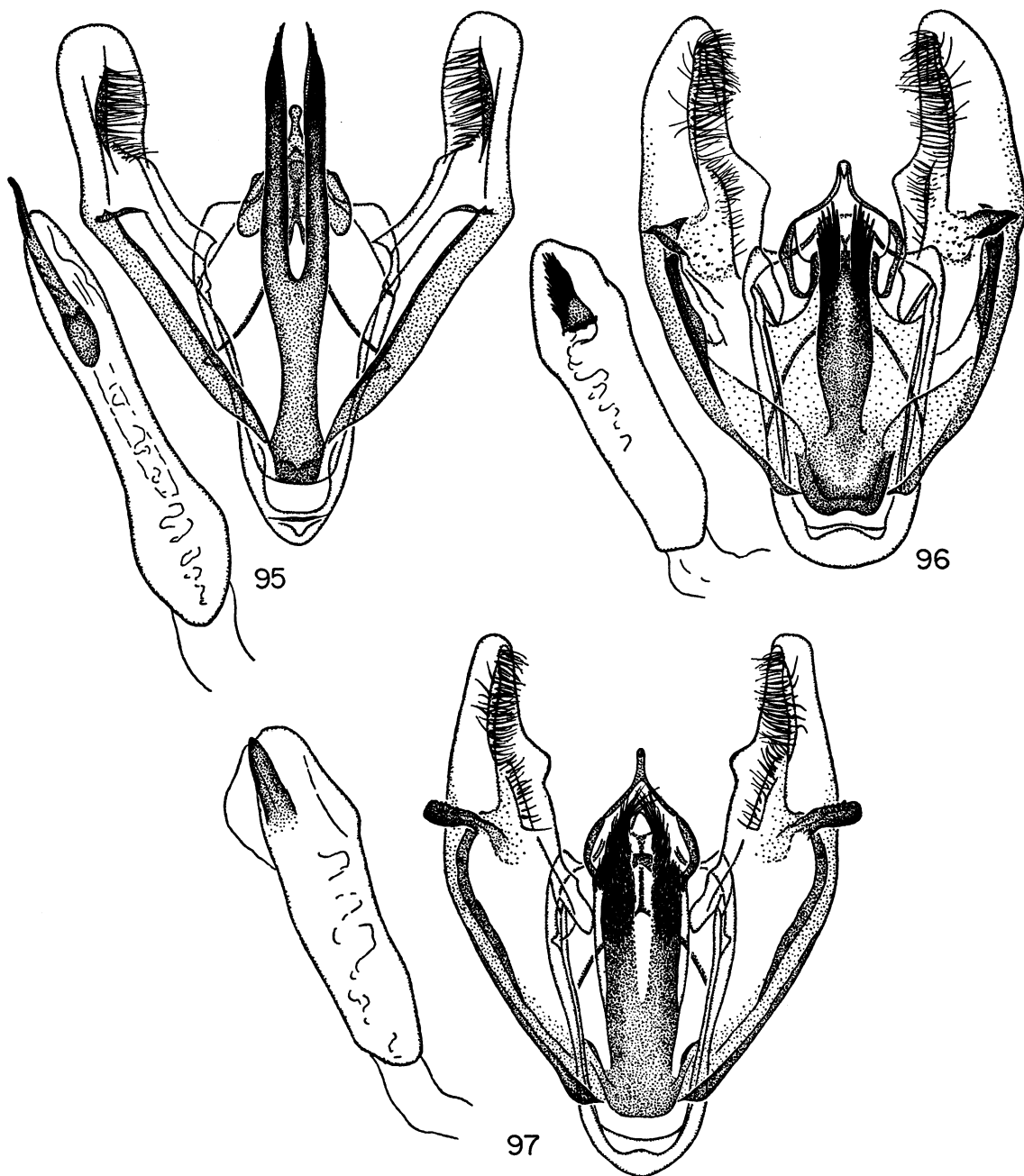
FIGS. 82-85. Male genitalia. 82. *Pherotesia gaviota* (Dognin), Coosnipata, Paucartambo, Cuzco, Peru, November 20, 1951 (F. L. Woytkowski; A.M.N.H.). 83. *P. lima*, new species, paratype, Rio Songo, Bolivia (Fassl; U.S.N.M.). 84. *P. subsimilis* Dognin, Ecuador (U.S.N.M.). 85. *P. ultrasimilis*, new species, paratype, Yungas del Palmar, Bolivia, May 3, 1949 (A.M.N.H.).



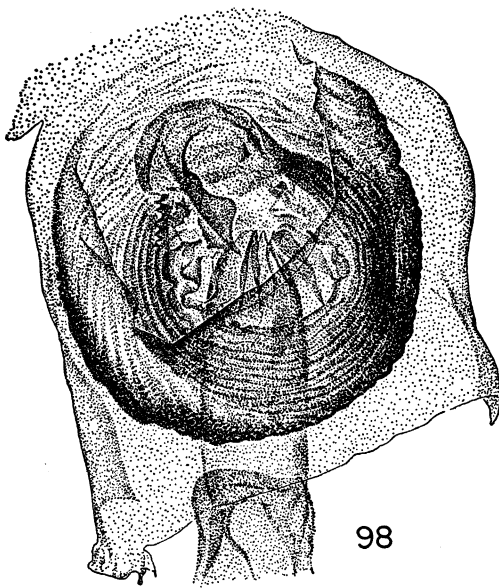
FIGS. 86-90. Male genitalia. 86. *Pherotesia lunata*, new species, holotype, Sierra del Libane, Colombia (H. H. Smith; B.M.N.H.). 87. *P. subjecta* W. Warren, Chaco, Bolivia (U.S.N.M.). 88. *P. malinaria minuisca*, new subspecies, holotype, Volcan de Chiriqui, Panama, May-June, 1898 (M. de Mathan; B.M.N.H.), right valve. 89. *P. malinaria malinaria* Schaus, Coatepec, Mexico (U.S.N.M.). 90. *P. supplanaria* (Dyar), Orosi, Costa Rica (Fassl; B.M.N.H.).



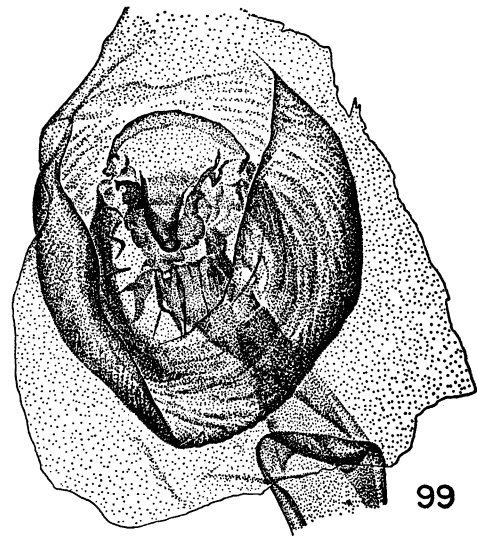
FIGS. 91-94. Male genitalia. 91. *Pherotesia falcis*, new species, holotype, Popocatepetl Park, Mexico, July, 1906 (U.S.N.M.). 92. *P. hamata*, new species, paratype, Mo Cuou, Oaxaca, Mexico, September 17, 1962 (E. C. Welling; A.M.N.H.). 93. *P. caeca*, new species, paratype, Mexico (A.M.N.H.). 94. *P. alterata* W. Warren, El Volcan, Chiriqui, Panama, February 18, 1936 (Lutz and Gertsch; A.M.N.H.).



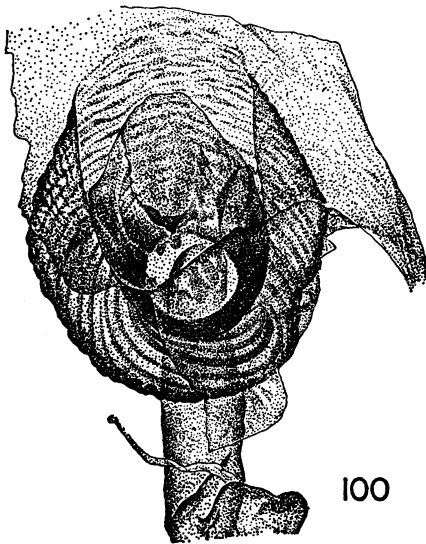
FIGS. 95-97. Male genitalia. 95. *Pherotesia bifurca*, new species, holotype, Volcan Santa Maria, Guatemala, June (Schaus and Barnes; U.S.N.M.). 96. *Melanotesia siderata* (Dognin), Rio Songo, Bolivia (Fassl; U.S.N.M.). 97. *M. intensa* (Dognin), Colombia (Fassl; U.S.N.M.).



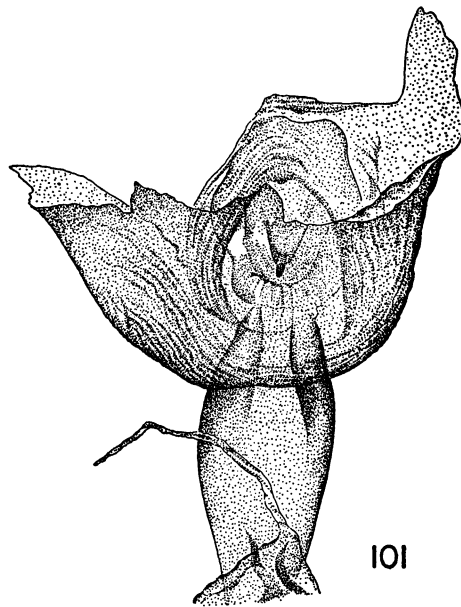
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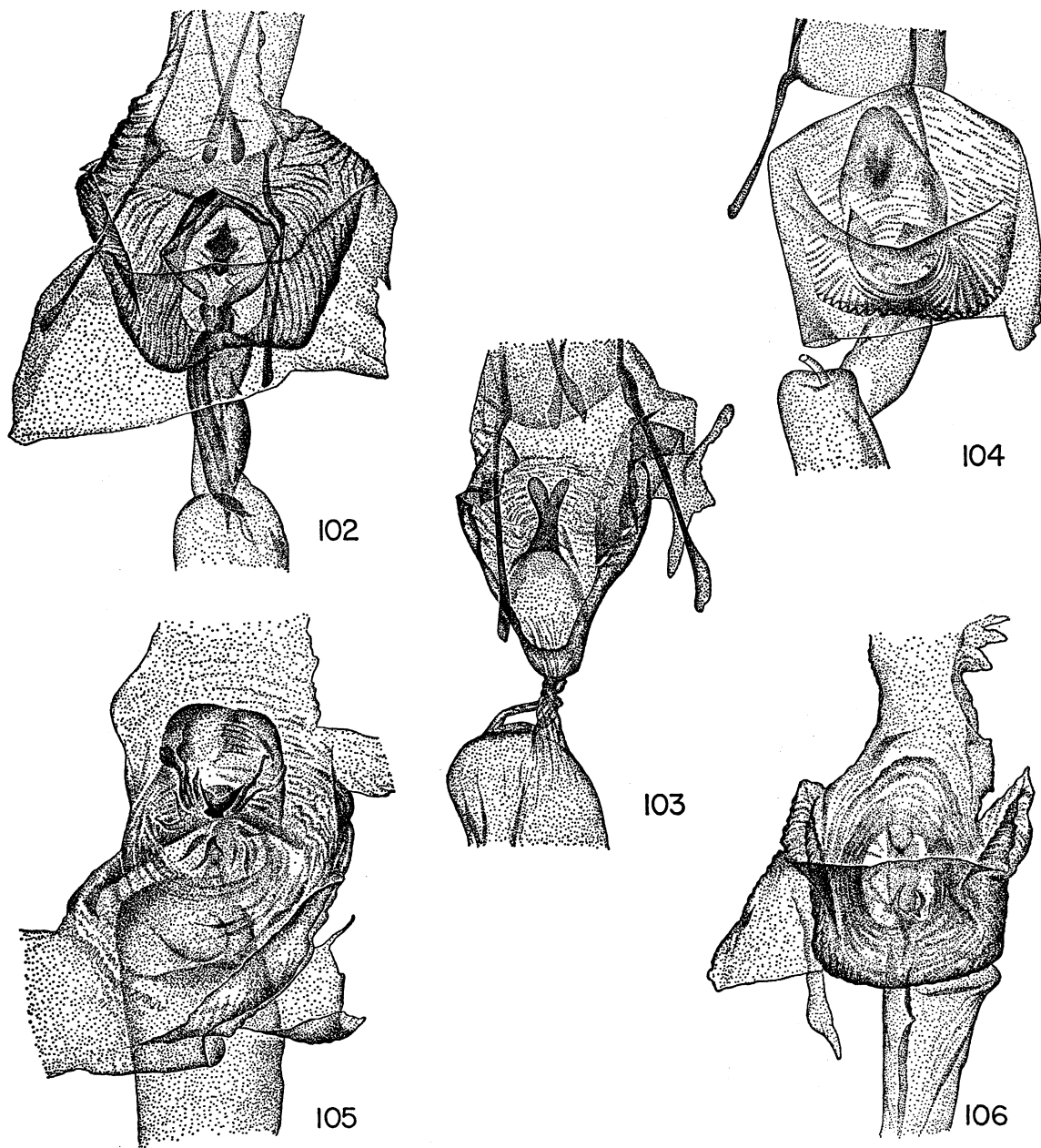


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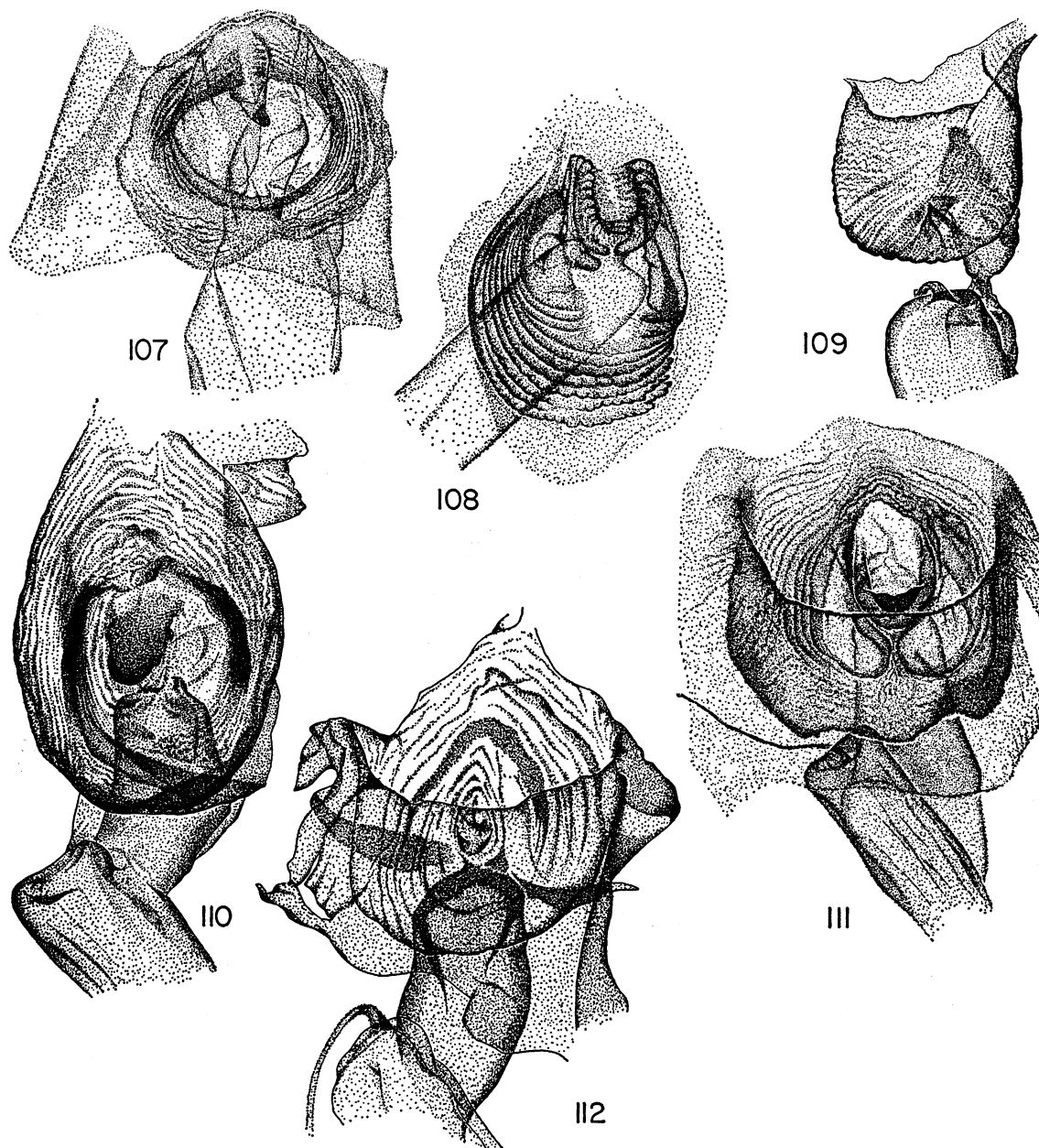


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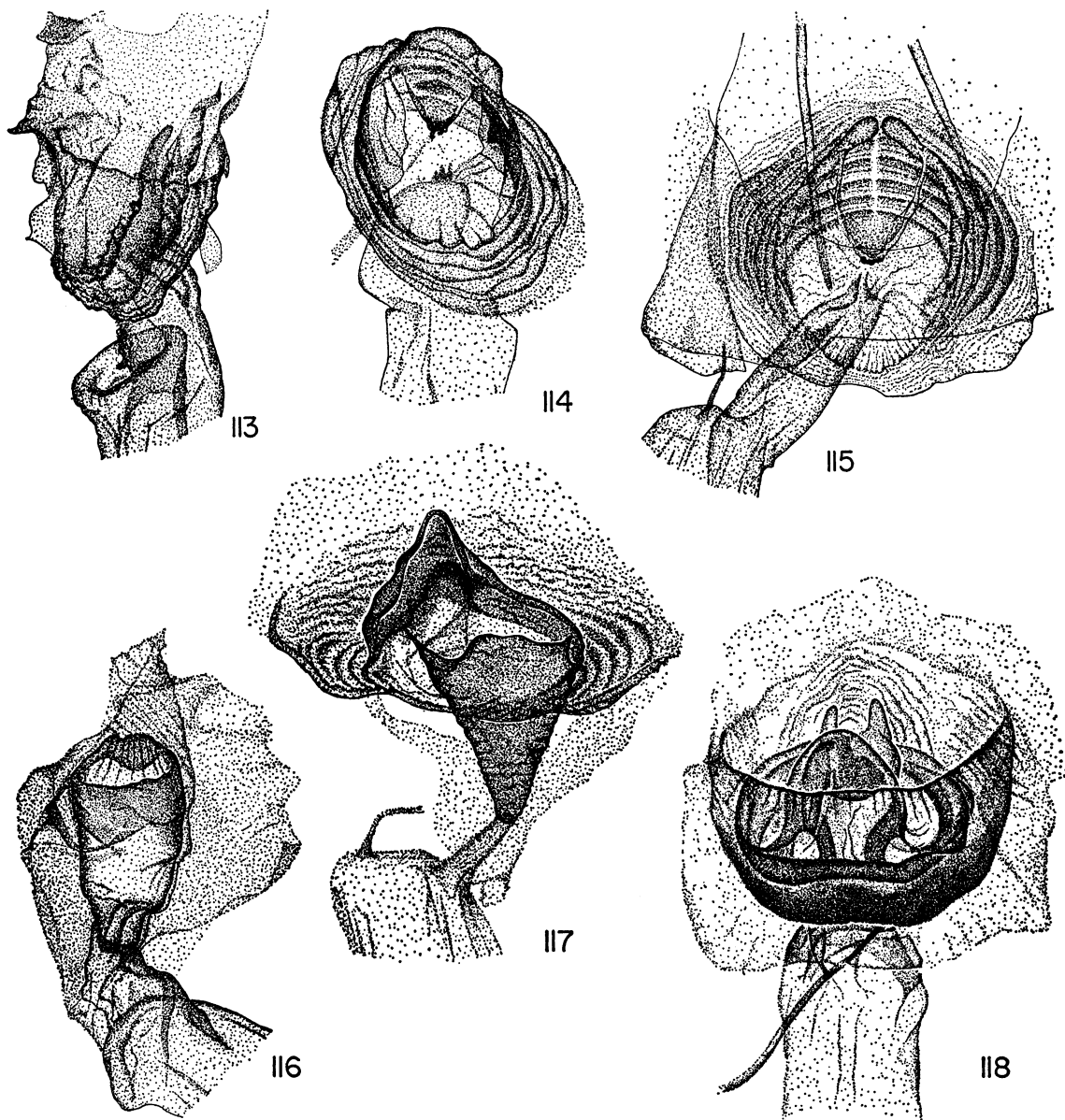
FIGS. 98-101. Sterigma and ductus bursae of female genitalia. 98. *Melanolophia delinquaria* (Walker), Iguassu, Paraná, Brazil, October 26, 1921 (B.M.N.H.). 99. *M. modica*, new species, paratype, Hansa Humboldt, Santa Catarina, Brazil, July, 1936 (A. Maller; B.M.N.H.). 100. *M. apicalis* (W. Warren), Castro, Paraná, Brazil, November, 1896 (E. D. Jones; B.M.N.H.). 101. *M. praeapicata* (W. Warren), Rio [de] Janeiro, Brazil (U.S.N.M.).



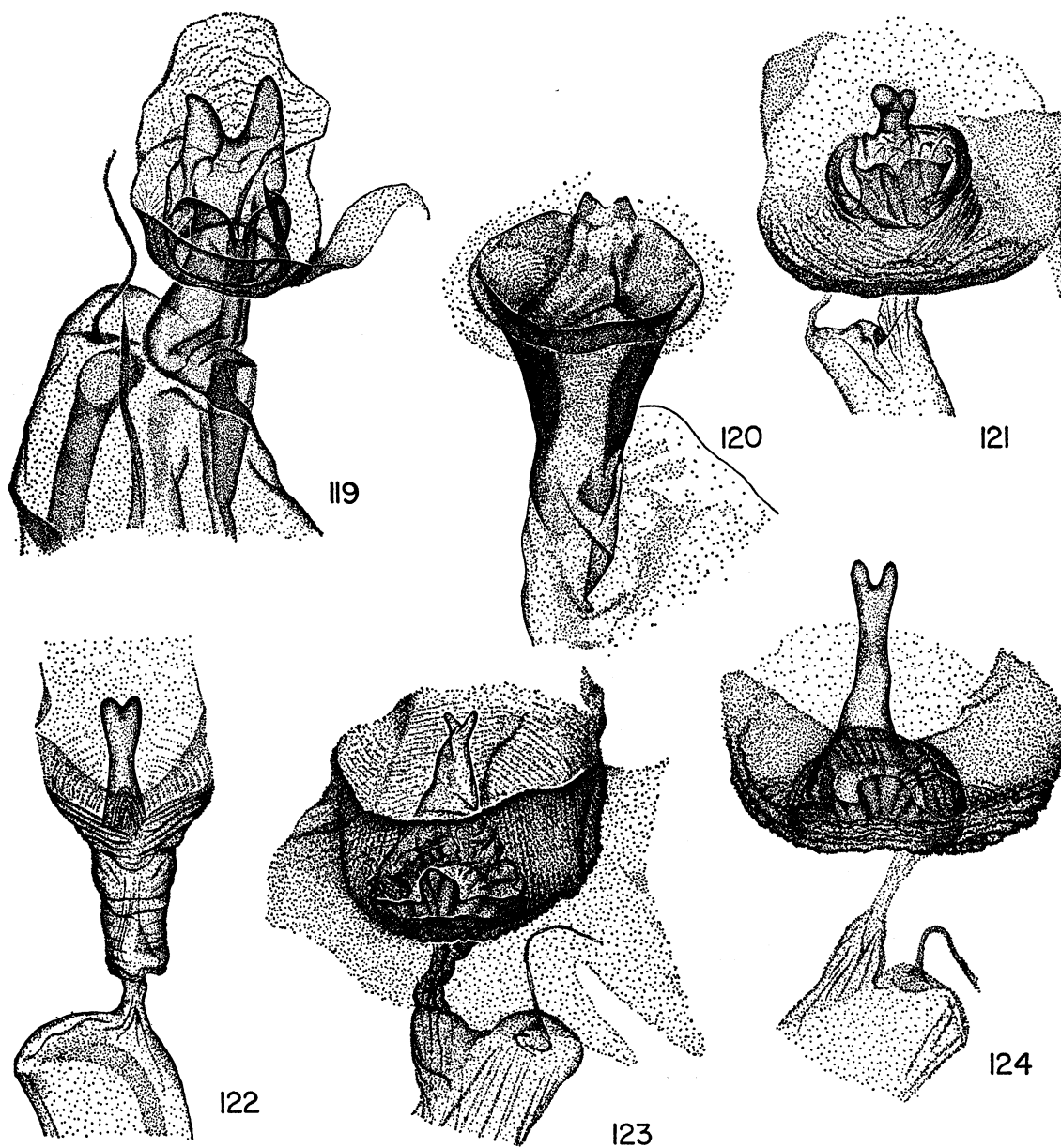
FIGS. 102-106. Sterigma and ductus bursae of female genitalia. 102. *Melanolophia centosa* (Schaus), Castro, Paraná, Brazil (B.M.N.H.). 103. *M. striata* (W. Warren), Oconeque, Carabaya, Peru, July, 1904 (G. Ockenden; B.M.N.H.). 104. *M. subatrata* (Dognin), Nuevo Teutonia, Brazil, April, 1953 (Plau-mann; A.M.N.H.). 105. *M. inatrata*, new species, paratype, Santo Domingo, Carabaya, Peru, December, 1901 (Ockenden; B.M.N.H.). 106. *M. conspicua* Schaus, Juan Vinas, Costa Rica, June (Schaus and Barnes; U.S.N.M.).



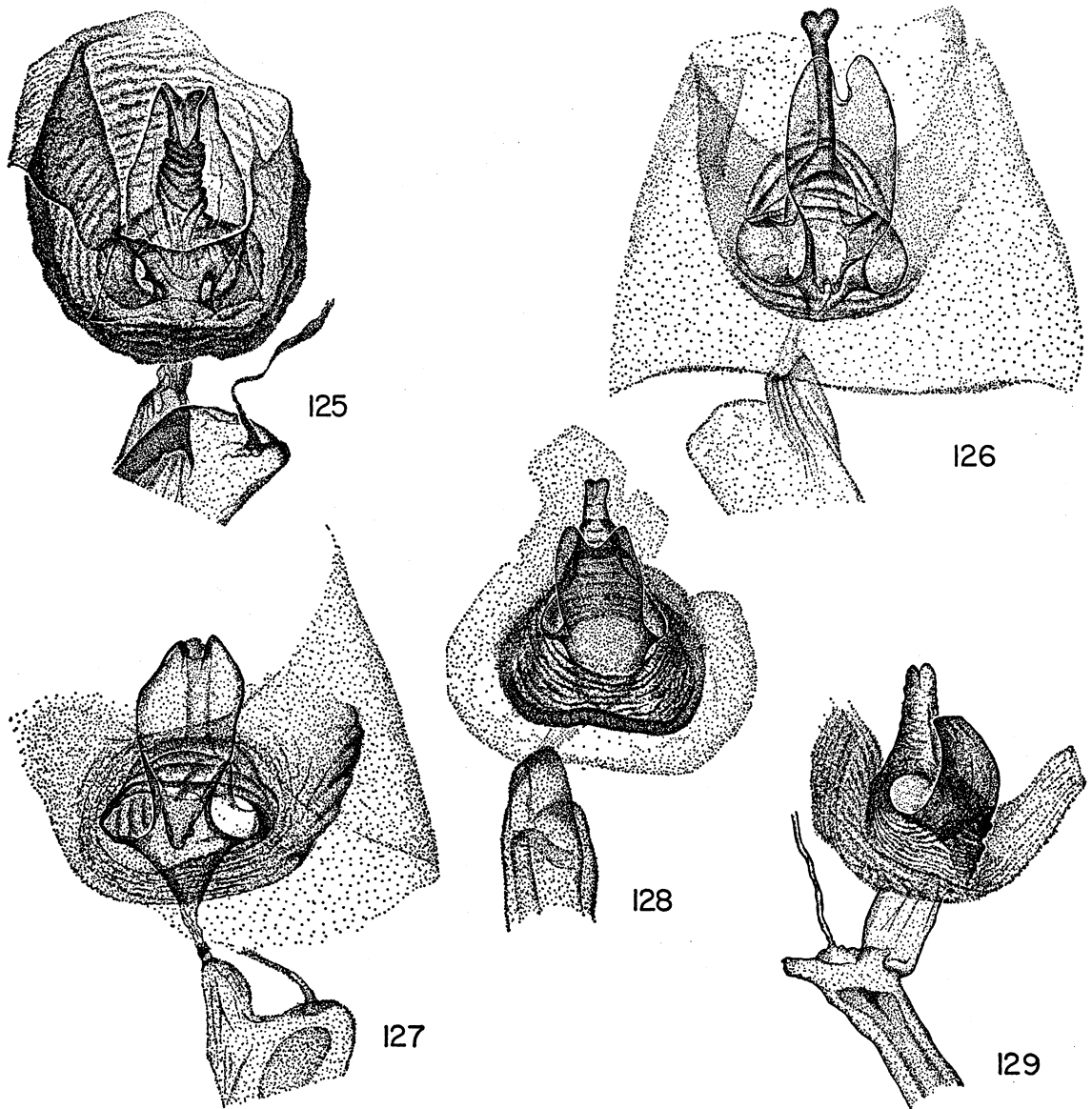
FIGS. 107-112. Sterigma and ductus bursae of female genitalia. 107. *Melanolophia fugitaria* Schaus, holotype, Juan Vinas, Costa Rica, May (U.S.N.M.). 108. *M. umbrosa*, new species, paratype, Region Chapare, Bolivia, June, 1951 (A.M.N.H.). 109. *M. tenebrosa* (W. Warren), Tucuman, Argentina (R. Schreiter; B.M.N.H.). 110. *M. muscitincta* (W. Warren), Santo Domingo, Carabaya, Peru, October, 1902 (G. Ockenden; B.M.N.H.). 111. *M. vulsa*, new species, holotype, Sierra del Libane, Colombia (H. H. Smith; B.M.N.H.). 112. *M. accurata* Prout, Medina, Colombia (Fassl; U.S.N.M.).



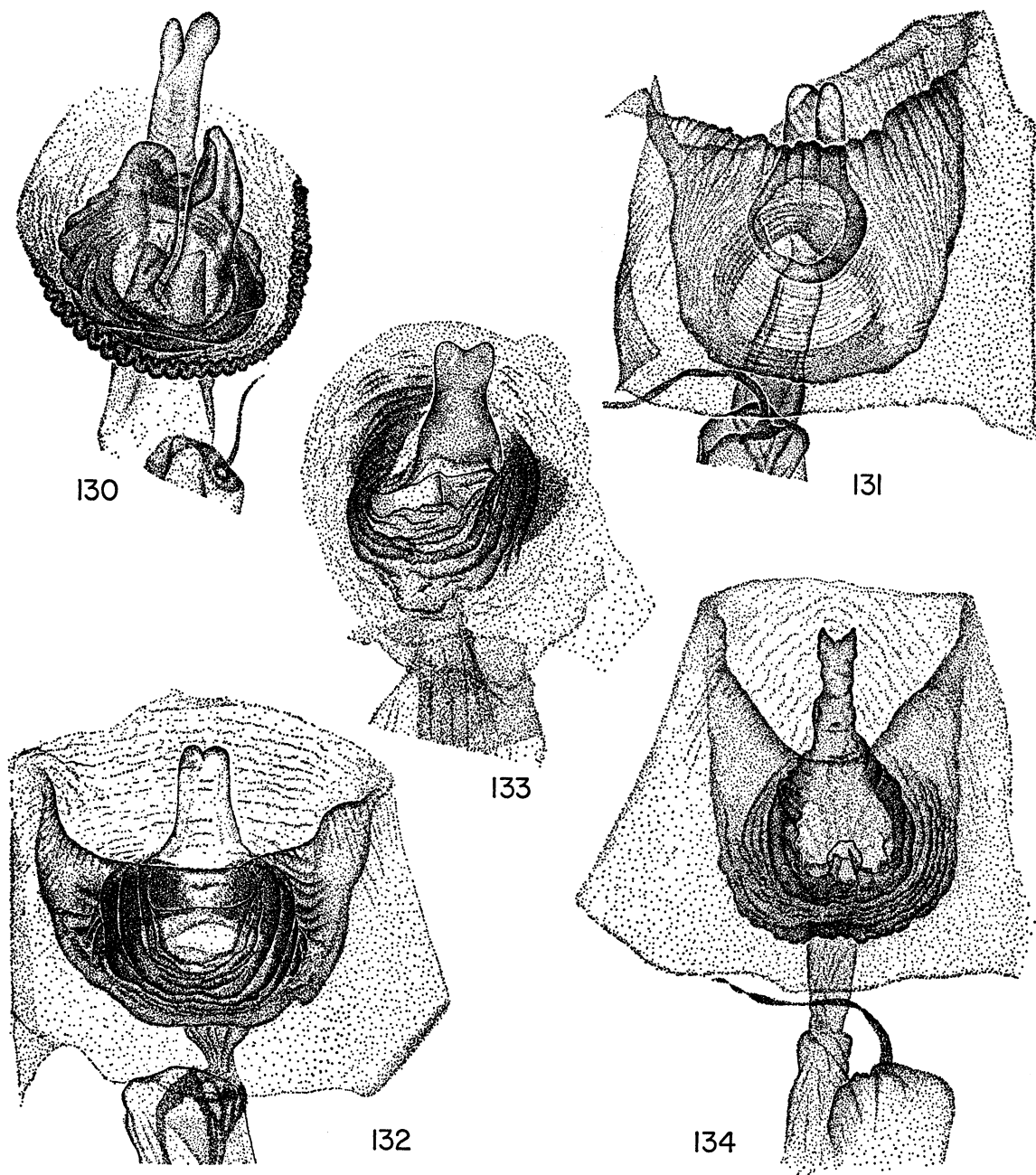
FIGS. 113–118. Sterigma and ductus bursae of female genitalia. 113. *Melanolophia rubrica*, new species, holotype, Cayuga, Guatemala, May (Schaus and Barnes; U.S.N.M.). 114. *M. eudoxa eudoxa*, new subspecies, allotype, Yungas del Palmar, Bolivia, April 10, 1950 (A.M.N.H.). 115. *M. trisurca trisurca* (Dognin), holotype, "Environs de Loja," Ecuador, 1889 (U.S.N.M.). 116. *M. perversa*, new species, paratype, Rio [de Janeiro?] (Derg.; B.M.N.H.). 117. *M. triloba*, new species, allotype, Jalapa, Mexico (Schaus; A.M.N.H.). 118. *M. penicilla*, new species, allotype, Zamora, Ecuador, July, 1886 (U.S.N.M.).



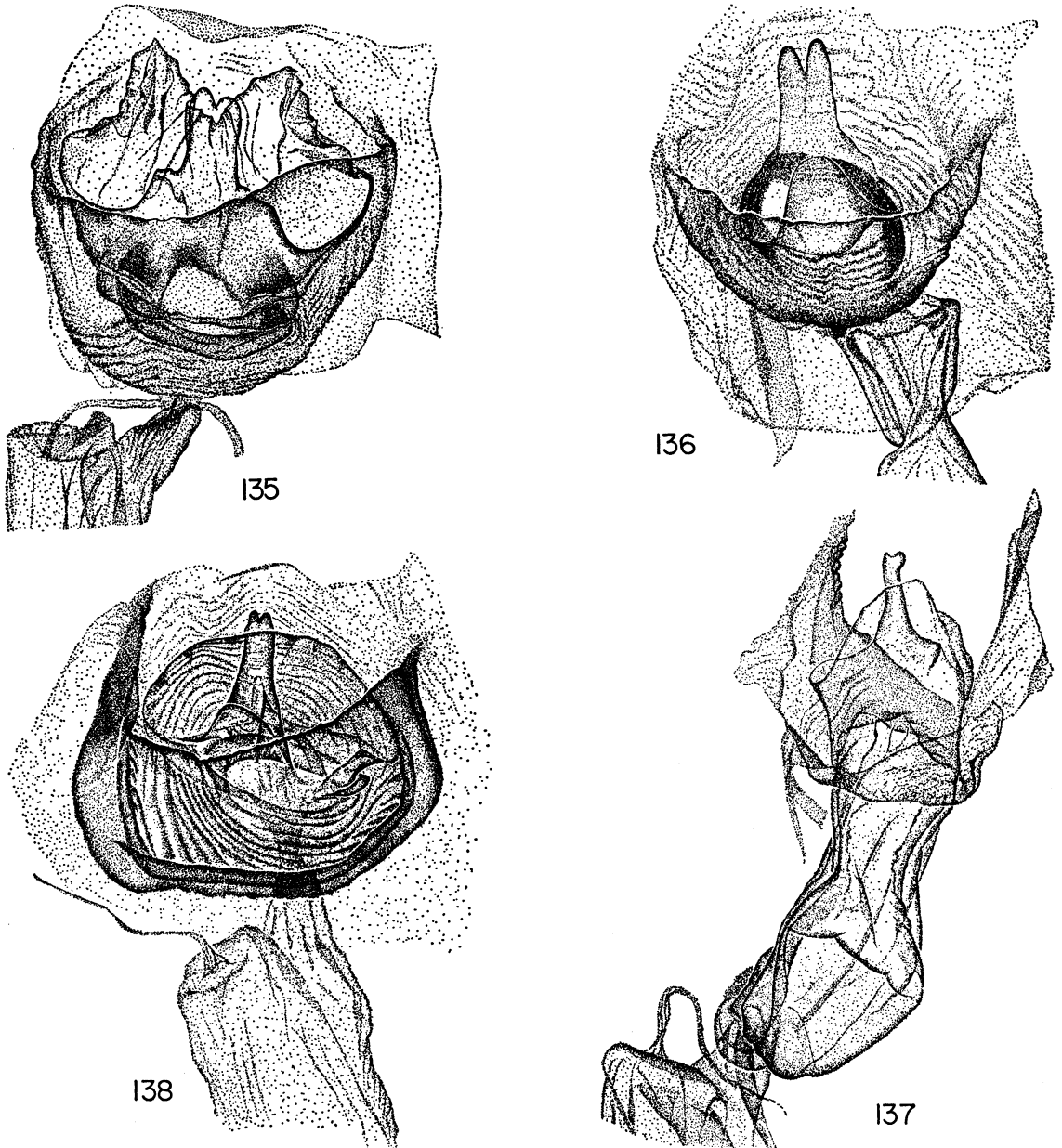
FIGS. 119–124. Sterigma and ductus bursae of female genitalia. 119. *Melanolophia sadrina sadrina* (Schaus), Mexico (F. Knab; U.S.N.M.). 120. *M. sadrinaria*, new species, allotype, Matamoros, Puebla, Mexico, November 2, 1920 (C. C. Hoffmann; A.M.N.H.). 121. *M. imitata imitata* (Walker), Wellington, British Columbia, May 14 (A.M.N.H.). 122. *M. centralis* McDunnough, Huachuca Mountains, Arizona, May 4, 1948 (Melander; A.M.N.H.). 123. *M. bostar* (Druce), Cordoba, Mexico, December 31, 1907 (F. Knab; U.S.N.M.). 124. *M. flexilinea flexilinea* (W. Warren), Orizaba, Veracruz, Mexico, 1937 (C. C. Hoffmann; A.M.N.H.).



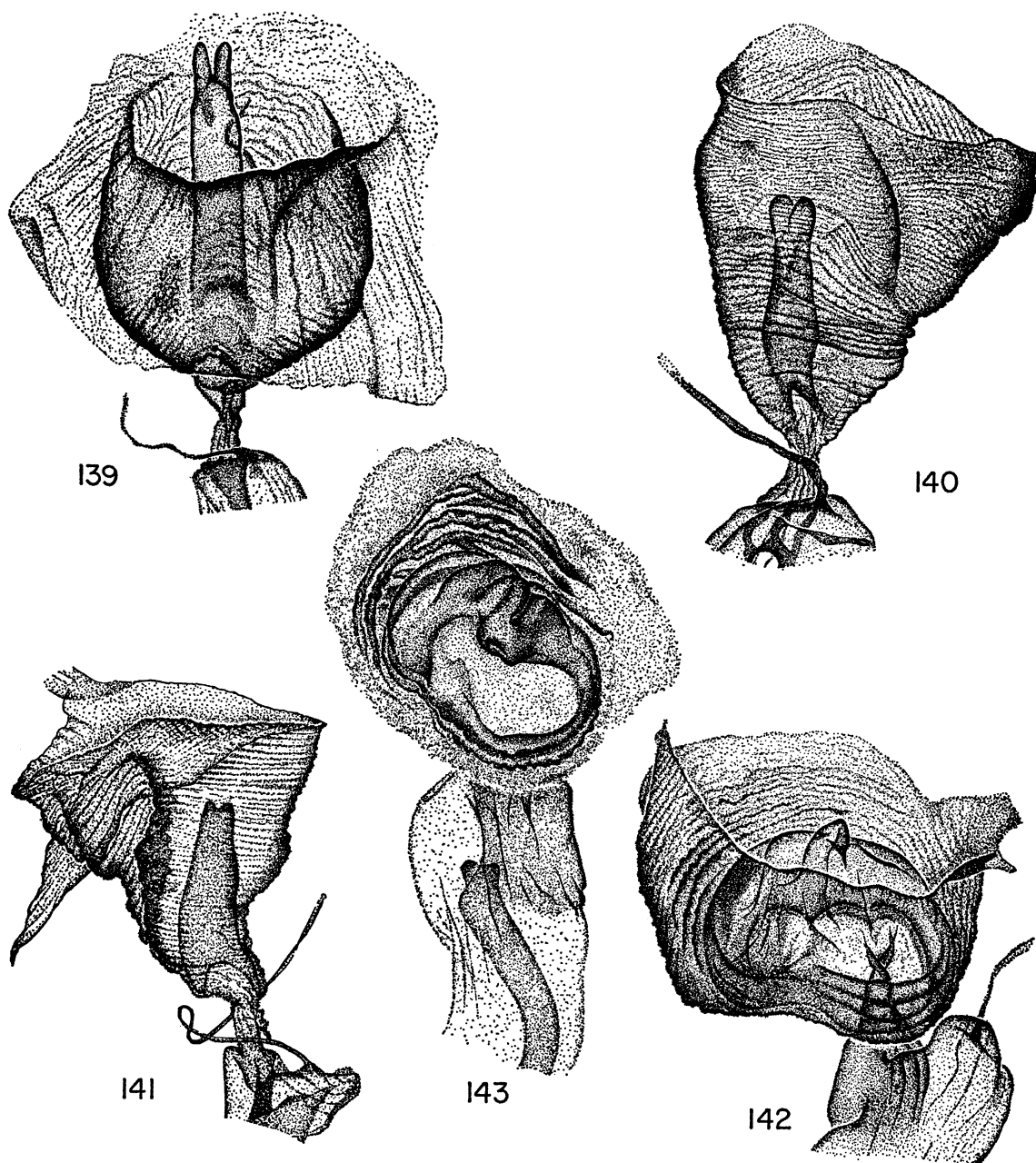
FIGS. 125-129. Sterigma and ductus bursae of female genitalia. 125. *Melanolophia canadaria canadaria* (Guenée), Randolph, New Hampshire, June 19, 1932 (J. L. Sperry; A.M.N.H.). 126. *M. signataria signataria* (Walker), Lynbrook, Long Island, New York, May 4, 1912 (A.M.N.H.). 127. *M. imperfectaria imperfectaria* (Walker), Brownsville, Texas, March 8 (A.M.N.H.). 128. *M. fimbriata*, new species, allotype, El Volcan, Chiriqui, Panama, February 16, 1936 (Lutz and Gertsch; A.M.N.H.). 129. *M. parma*, new species, paratype, El Volcan, Chiriqui, Panama, February 17, 1936 (Lutz and Gertsch; A.M.N.H.).



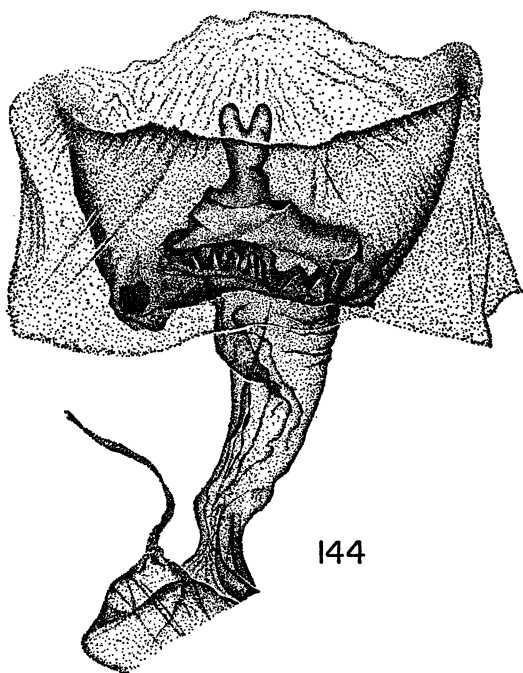
FIGS. 130-134. Sterigma and ductus bursae of female genitalia. 130. *Melanolophia orthotis* Prout, Chapare, Bolivia, May, 1951 (A.M.N.H.). 131. *M. intervallata* (W. Warren), Tuis, Costa Rica, August (B.M.N.H.). 132. *M. reducta meridiana*, new subspecies, paratype, Oconeque, Carabaya, Peru, February, 1905 (G. Ockenden; B.M.N.H.). 133. *M. corza* (Dognin), Region Chapare, Bolivia, September 25, 1949 (A.M.N.H.). 134. *M. madefactaria* (Dyar), holotype, Dominica, June-July, 1913 (H. W. Foote; U.S.N.M.).



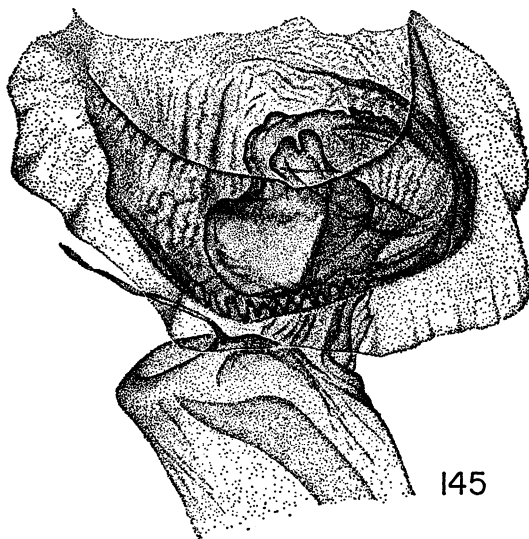
FIGS. 135-138. Sterigma and ductus bursae of female genitalia. 135. *Melanolophia reductaria*, new species, paratype, Oconeque, Carabaya, Peru, July, 1904 (G. Ockenden; B.M.N.H.). 136. *M. isoforma*, new species, allotype, Monte Tolima, Colombia, February, 1910 (A. H. Fassl; B.M.N.H.). 137. *M. attenuata*, new species, paratype, Orosi, Costa Rica (Fassl; B.M.N.H.). 138. *M. commotaria* (Maassen), San Antonio, Colombia, December, 1907 (M. G. Palmer; B.M.N.H.).



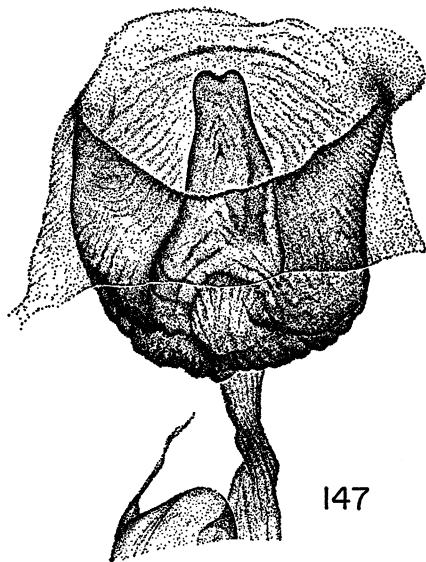
FIGS. 139-143. Sterigma and ductus bursae of female genitalia. 139. *Melanolophia mutabilis* (W. Warren), Jamaica (U.S.N.M.). 140. *M. venatia*, new species, paratype, Incachaca, Cochabamba, Bolivia (J. Steinbach; U.S.N.M.). 141. *M. elegia*, new species, paratype, Orizaba, Mexico (U.S.N.M.). 142. *M. mal-lea*, new species, allotype, La Oroya, R[io] Inambari, Peru, September, 1904 (G. Ockenden; B.M.N.H.). 143. *M. bugnathos bugnathos*, new subspecies, allotype, Yungas del Palmar, Bolivia, April 10, 1950 (A.M.N.H.).



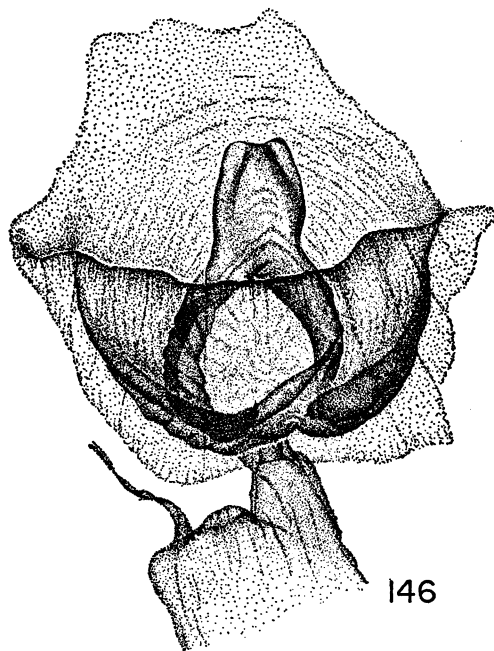
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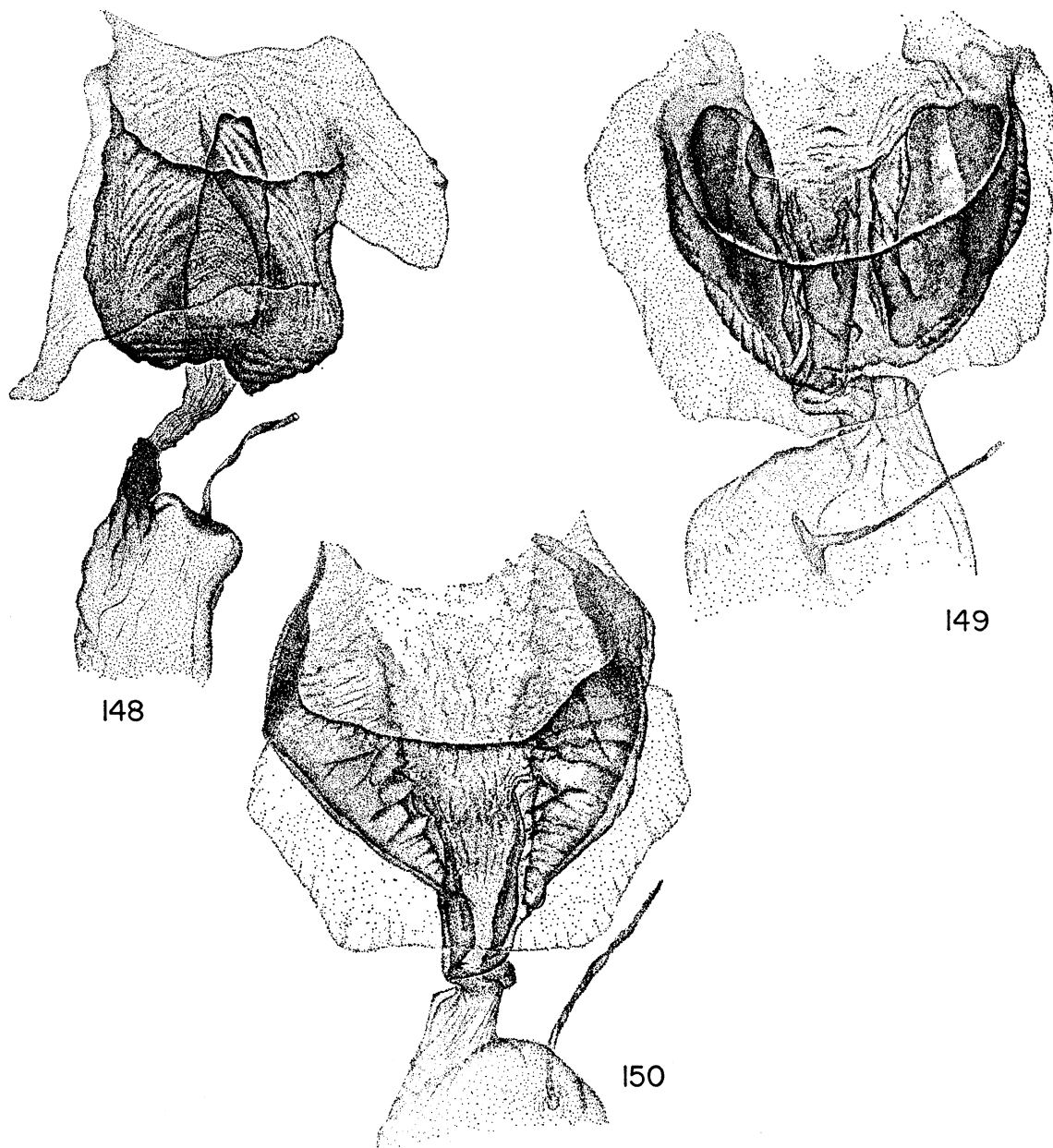


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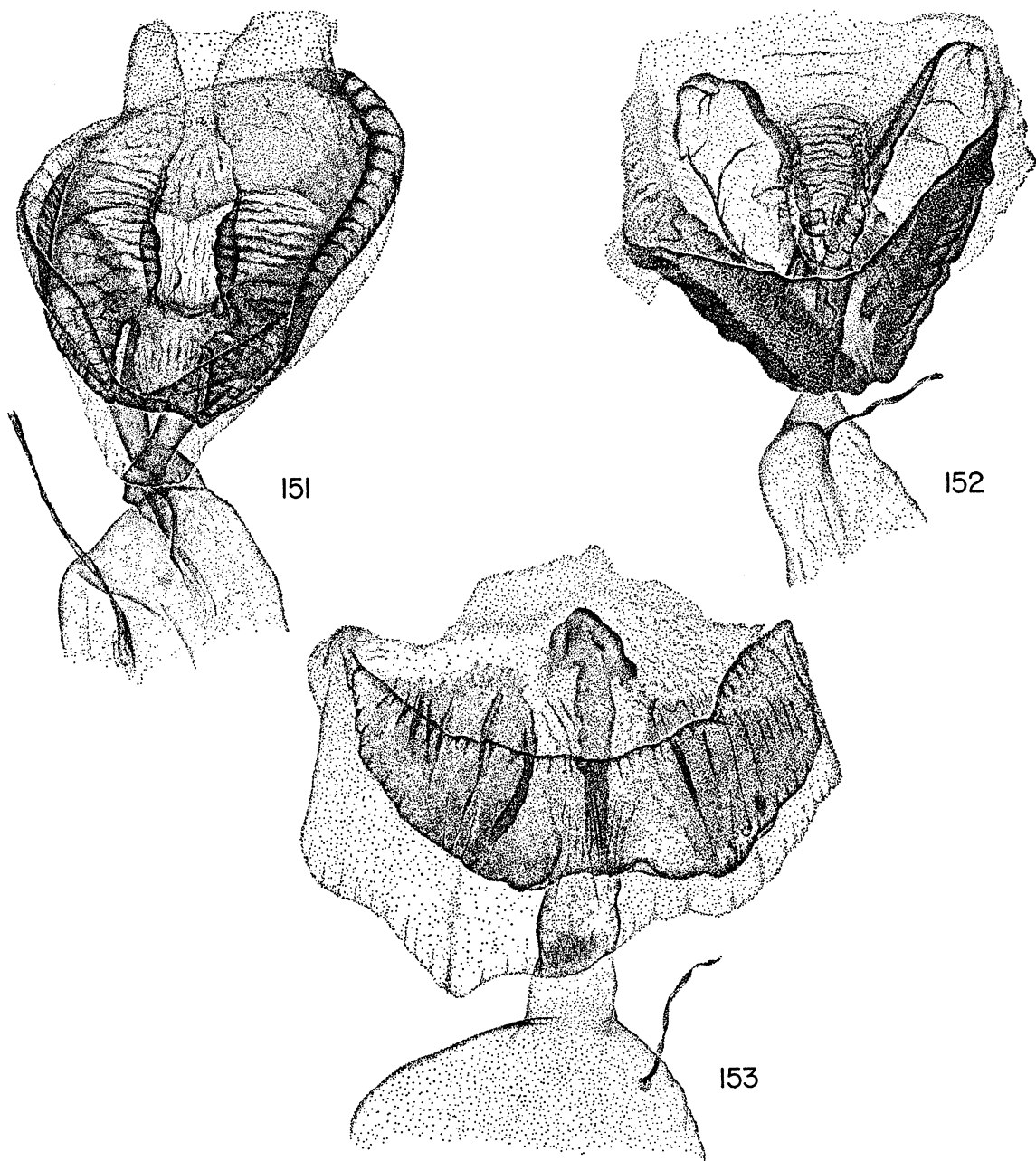


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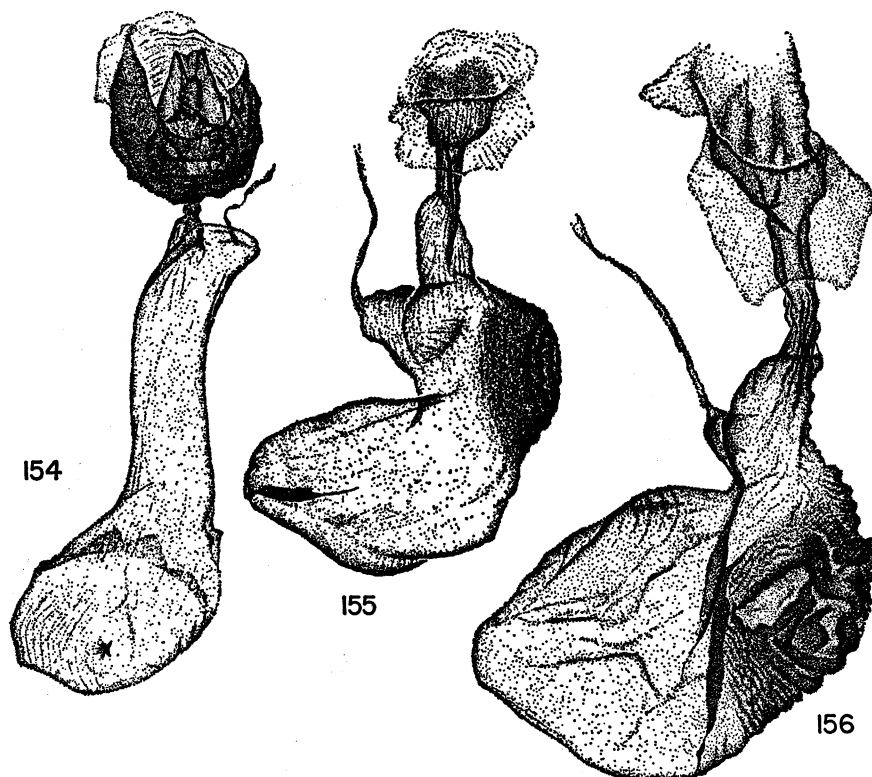
FIGS. 144-147. Sterigma and ductus bursae of female genitalia. 144. *Melanolophia spatiosata* (Dognin), Santo Domingo, Carabaya, Peru, October, 1902 (G. Ockenden; B.M.N.H.). 145. *M. eucheria* Schaus, Rio Laeiss, Blumenau, Santa Catarina, Brazil, December, 1933 (F. H. Hoffman; B.M.N.H.). 146. *M. consimiliaria* (Walker), Nova Bremen, Santa Catarina, Brazil, April, 1908 (F. Hoffman; B.M.N.H.). 147. *M. agnataria* (Snellen), "Ob. Rio Negro, Ost Colombia" (Fassl; B.M.N.H.).



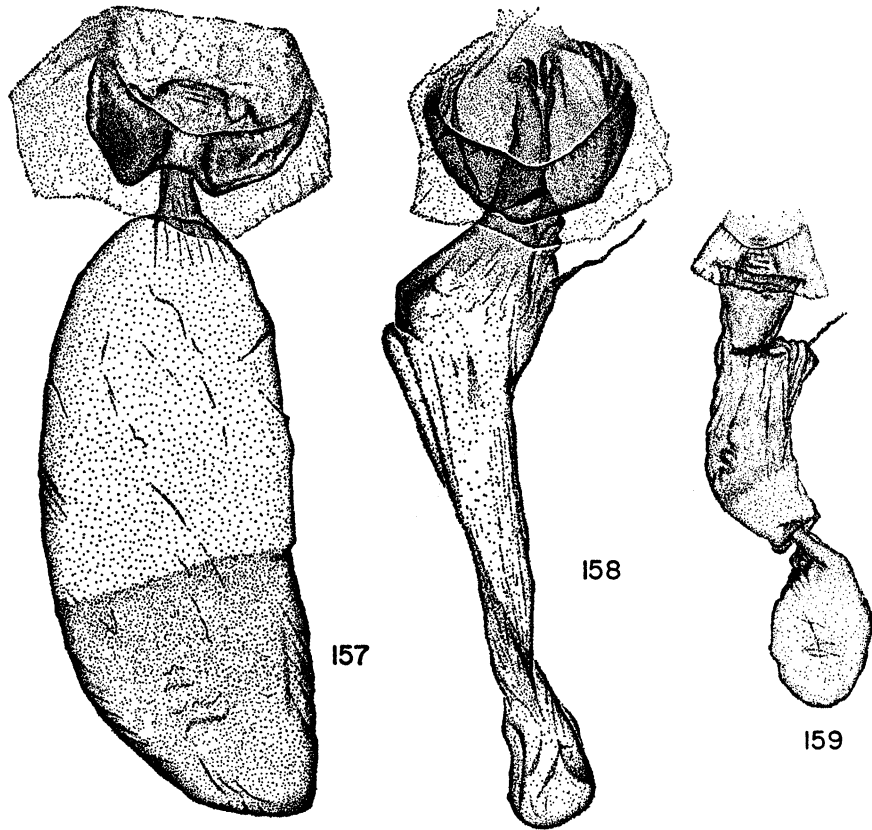
FIGS. 148-150. Sterigma and ductus bursae of female genitalia. 148. *Melanolophia orthoconara*, new species, paratype, Orosi, Costa Rica (Fassl; B.M.N.H.). 149. *Pherotesia lima*, new species, allotype, "Intaj," Ecuador (Buckley; B.M.N.H.). 150. *P. subsimilis* Dognin, Santo Domingo, Carabaya, Peru, December, 1902 (G. Ockenden; B.M.N.H.).



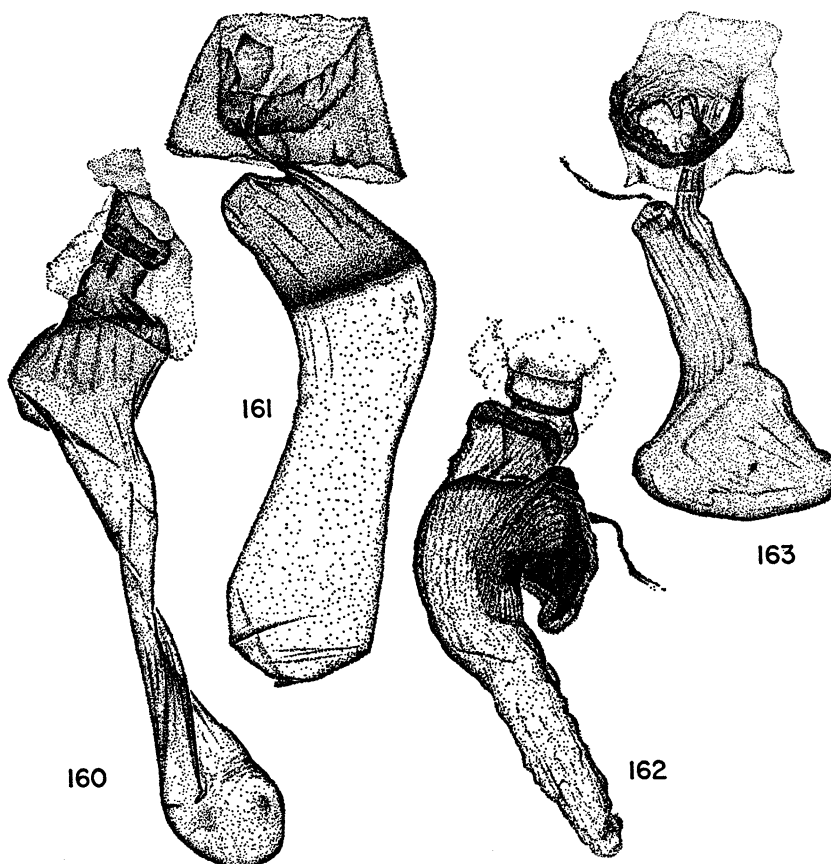
FIGS. 151-153. Sterigma and ductus bursae of female genitalia. 151. *Pherotesia ultrasimilis*, new species, allotype, Santo Domingo, Carabaya, Peru (U.S.N.M.). 152. *P. subjecta* W. Warren, Incachaca, Cochabamba, Bolivia (J. Steinbach; U.S.N.M.). 153. *P. malinaria malinaria* Schaus, Puerto Eligio, Oaxaca, Mexico, September 27, 1961 (E. C. Welling; A.M.N.H.).



FIGS. 154-156. Female genitalia. 154. *Melanolophia canadaria canadaria* (Guenée), Randolph, New Hampshire, June 19, 1932 (J. L. Sperry; A.M.N.H.). 155. *Pherotesia condensaria* (Guenée), Castro, Paraná, Brazil (U.S.N.M.). 156. *P. confusata* (Walker), Rio Laeiss, Blumenau, Santa Catarina, Brazil, December, 1933 (F. H. Hoffman; B.M.N.H.).



FIGS. 157-159. Female genitalia. 157. *Pherotesia potens* W. Warren, Yungas del Palmar, Bolivia, April 10, 1950 (A.M.N.H.). 158. *P. gaviola* (Dognin), Santo Domingo, Carabaya, Peru, October, 1902 (G. Ockenden; B.M.N.H.). 159. *P. supplanaria* (Dyar), holotype, Misantla, Mexico, October, 1911 (R. Muller; U.S.N.M.).



FIGS. 160-163. Female genitalia. 160. *Pherotesia hamata*, new species, Mo Cuou, Oaxaca, Mexico, September 17, 1962 (E. C. Welling; A.M.N.H.). 161. *P. funebris* (Schaus), holotype, Juan Vinas, Costa Rica, January (U.S.N.M.). 162. *P. caeca*, new species, "T.A.C." (B.M.N.H.). 163. *P. alterata* W. Warren, Tuis, Costa Rica, August (Schaus and Barnes; U.S.N.M.).

APPENDIX: SPECIMENS EXAMINED

WHILE THE DISTRIBUTION is summarized under the heading of Range for each taxon, the complete data for all specimens examined of previously described species are given below. Whenever possible, the department, province, or state is given for the larger countries; if this was not given on the label it has been inserted in brackets. The spelling of certain names has been altered from that indicated on the labels, unless given in quotation marks, to conform with the approved present-day spelling. Dates of capture, elevations, and collectors are given whenever possible; to simplify the presentation, the first of these is given for the months only, to help keep the information as brief as possible.

The arrangement of the species is the same as that given in the text.

GENUS *MELANOLOPHIA* HULST

GROUP I

Melanolophia delinquaria (Walker)

BRAZIL: Uberaba, Minas Gerais, 1 ♀; Mogy Guassú, São Paulo (T. G. Foelsterle), 1 ♂; Iguassu, Paraná, Oct., Nov., 2 ♂, 1 ♀; Novo Friburgo, [Rio de Janeiro], 3 ♂; Rio Laeiss, Blumenau, Santa Catarina, Sept. (F. H. Hoffman), 1 ♂; Nuevo Teutonia, [Santa Catarina], Jan., Mar., Apr., May, July, Nov., Dec. (F. Plaumann), 17 ♂, 6 ♀; Pelotas, Rio Grande do Sul, Jan., Mar., Apr., Oct., Dec. (C. Biezanko), 8 ♂, 2 ♀.

PARAGUAY: Independencia, [Caazapa], Jan., Sept., Oct., Nov., Dec. (Schade), 11 ♂, 5 ♀; Carlos Pfannl, Sept., 2 ♂; Caa-genzú, Nov., 1 ♂; Paso Yobay, Nov. (Schade), 2 ♂, 1 ♀; Nuevo Germania (Heyneigle), 2 ♂; Paraguay central (P. Germain), 1 ♂; Sapucay, [Paraguari], Sept., Nov. (W. S. Foster), 3 ♂, 1 ♀; no further data, 1 ♂.

ARGENTINA: Puerto Aguirre, [Misiones], Jan. (F. Bourquin), 1 ♂.

Melanolophia apicalis (W. Warren)

BRAZIL: Castro, Paraná, 4 ♂, 1 ♀, Aug., Nov. (E. D. Jones), 2 ♂, 2 ♀; Nuevo Teutonia, [Santa Catarina], Apr., May, July, Dec. (F. Plaumann), 5 ♂; Dona Emma, Santa Catarina, Nov. (P. Hoffman), 1 ♂; Pelotas, Rio Grande do Sul, Nov. (C. Biezanko), 1 ♂; Santa Anna do Livraments, Rio Grande do Sul, Jan. (C. Biezanko), 3 ♂.

PARAGUAY: Páguay, [Misiones], 1 ♂; no further data, 1 ♂.

ARGENTINA: San Carlos de Barilache, Rio

Negro, Feb. (J. Foerster), 1 ♂; Buenos Aires (H. Wilkinson), 1 ♂.

Melanolophia praeapicata (W. Warren)

BRAZIL: Pasa Quatro, Minas Gerais, 1 ♂; Alto da Serra, São Paulo, Feb. (Pohl), 1 ♂; Castro, Paraná, 2 ♂, 2 ♀; Paraná (F. Johnson), 2 ♂; Nuevo Teutonia, [Santa Catarina], Jan., Apr., May, July, Nov., Dec. (F. Plaumann), 3 ♂, 6 ♀; New Bremen, Rio Laeiss, Santa Catarina, Jan., June (F. Hoffmann), 2 ♀; Jaragua do Sul, Santa Catarina, Aug. (F. Hoffmann), 1 ♀; [Santa] C[atarina], 1 ♂; Campo Bello, Rio [de] Janeiro (Zikan), 1 ♂; Rio [de] Janeiro, 1 ♀; Salesopolis, Baracea, Aug. (Pearson), 2 ♂; no further data, 1 ♂.

PARAGUAY: Independencia, [Caazapa], Nov., 1 ♂; Paso Yobay, July, Nov., 2 ♂; Sapucay, [Paraguari], Sept. (W. Foster), 3 ♂.

ARGENTINA: Territre. des Misiones, Nov., 1 ♂; Haut Parana [River], San Ignacio, Misiones, Sept., 1 ♀; no further data, 2 ♂, 1 ♀.

Melanolophia centosa Schaas

BRAZIL: Castro, Paraná, 1 ♂, 2 ♀ (including type of *centosa*), 950 meters (E. D. Jones), 3 ♂; São Paulo, 2 ♂.

GROUP II

Melanolophia striata (W. Warren)

PERU: Coosnipata, Paucartambo, Cuzco, Nov., Dec. (F. L. Woytkowski), 2 ♂; Callanga, Paucartambo, Cuzco, Feb. (F. L. Woytkowski), 1 ♂; Cerro de Pasco, Huancabamba (E. Boettger), 2 ♂; Huancabamba, [Piura], 3 ♂; Oxapampa, [Pasco], 6400 ft., 3 ♂, 2000 meters, 2 ♂; Uruhuasi, [Puno], "4-5," 7000 ft. (H. and C. Watkins), 1 ♂; Oconeque, Carabaya, [Puno], July (dry season), 7000 ft. (G. Ockenden), 2 ♀.

BOLIVIA: Yunga del Espíritu Santo, Cochabamba (P. Germain), 4 ♂; Charaplaya, [Cochabamba], June, 1300 meters (Simons), 1 ♂; Rio Songo, 750 meters (Fassl), 1 ♂; no further data (G. Garlepp), 1 ♂.

Melanolophia subatrata (Dognin)

BRAZIL: Uberaba, Minas Gerais, 1 ♂; Nuevo Teutonia, [Santa Catarina], Jan., Feb., Mar., July, Aug., Nov. (F. Plaumann), 7 ♂, 4 ♀; Pelotas, Rio Grande do Sul, Jan., Dec. (C. Biezanko), 2 ♂, 1 ♀; Rio Grande do Sul, May, 1 ♀; Santa Cruz, "Bresil meridionale," 1 ♂ (type of *subatrata*).

PARAGUAY: Sapucay, [Paraguari], Oct., Nov.

(W. Foster), 3 ♂; no further data, 2 ♂ (including type of *viriditincta*).

No data: 1 ♀.

Melanolophia conspicua Schaus

COSTA RICA: Tuis, May, July (Schaus and Barnes), 1 ♂, 2 ♀; Juan Vinas, June, Nov. (Schaus and Barnes), 2 ♂, 1 ♀ (including type of *conspicua*).

Melanolophia fugitaria Schaus

COSTA RICA: Juan Vinas, May, 1 ♀ (type of *fugitaria*).

GROUP III

Melanolophia tenebrosa (W. Warren)

ARGENTINA: Tucuman (R. Schreiter), 4 ♂, 4 ♀; El Siambon, Tucuman, Jan., 1600–1700 meters (R. Schreiter), 2 ♀.

Melanolophia muscitincta (W. Warren)

PERU: Santo Domingo, Carabaya, [Puno], 6500 ft., Oct. (dry season), Dec. (wet season) (G. Ockenden), 1 ♂, 1 ♀; Coosnipata, Paucartambo, Cuzco, Nov. (F. L. Woytkowski), 2 ♂; La Merced, [Pasco], Sept. (Rivas), 1 ♂; Oxapampa, [Pasco], 2000 meters, 1 ♂.

Melanolophia limosa (Dognin)

ECUADOR: "Environs de Loja," [Loja], 13 ♂ (including lectotype of *limosa*); Loja, [Loja], 1 ♂; El Monje, "prés Loja," 2 ♂; Zamora, [Santiago Zamora], 1 ♂.

Melanolophia accurata Prout

COLOMBIA: San Antonio, Cali, [Valle del Cauca], Feb., Mar., Oct., Dec., 1700–2000 meters (Fassl), 11 ♂; Alto de Las Cruces, [Norte de Santander], 2000 meters (Fassl), 1 ♂; Medina, [Boyaca], 500 meters (Fassl), 1 ♀; Riv. Vitaco, Nov., 2500 meters (Fassl), 1 ♂; no further data (Fassl), 3 ♂.

Melanolophia trisurca trisurca (Dognin)

ECUADOR: "Environs de Loja," [Loja], 1 ♂, 1 ♀ (including type of *trisurca*).

Melanolophia munda (W. Warren)

PERU: Cushi, Huánuco, 1900 meters (W. Hoffmanns), 1 ♂.

GROUP IV

Melanolophia sadrina sadrina (Schaus)

MEXICO: Jalapa, [Veracruz] (W. Schaus; M. Trujillo), 4 ♀; Orizaba, [Veracruz], Feb., Mar., May, June, 1 ♂, 7 ♀; Cordoba, [Veracruz], May, 8 ♀, (H. Rümeli), 3 ♂, 1 ♀, identified as "*Tephrosia bostar* Druce, B.C.A. Lep. Het., Godman-

Salvin coll."; Misantla, Veracruz, May, June, 2 ♀, (W. Goodmann), 4 ♂, 1 ♀; Atoyac, Veracruz, May (H.H.S.), 1 ♂, identified as "*Tephrosia bostar* Druce, B.C.A. Lep. Het., Godman-Salvin coll."; Uruapan, [Michoacan], Mar., 1 ♀; no further data (F. Knab), 1 ♀.

BRITISH HONDURAS: Orange Walk, Aug., Dec., 1 ♂, 1 ♀.

GUATEMALA: Cayuga, Apr., May, Aug., Sept. (Schaus and Barnes), 4 ♂, 3 ♀; Purulha, July (Schaus and Barnes), 1 ♂; Las Mercedes, 3000 ft. (Champion), 2 ♂, 1 ♀, identified as "*Tephrosia bostar* Druce, B.C.A. Lep. Het., Godman-Salvin coll."; Volcan de Atitlan, 2500–3500 ft. (Champion), 1 ♀, identified as "*Tephrosia bostar* Druce, B.C.A. Lep. Het., Godman-Salvin coll."

HONDURAS: La Cambre, Feb. (J. Lienhart), 1 ♀.

COSTA RICA: Tuis, May–June, July, 2400 ft., 2 ♂, 1 ♀; Sixola River, Mar. (Schaus and Barnes), 1 ♂, 1 ♀; San José, Jan., July, 4000 ft., 1 ♂, 1 ♀; Cachi, 1 ♂; Juan Vinas, June (Schaus and Barnes), 1 ♂; San Carlos, June (Underw.), 1 ♀; Santa Clara Valley, 1200 ft. (F. A. Zurcher), 1 ♀; no further data (Underwood), 1 ♂.

No data: 1 ♂, 1 ♀.

GROUP V

Melanolophia bostar (Druce)

GUATEMALA: Volcan Santa Maria, June, July, Aug., Oct. (Schaus and Barnes), 2 ♂, 3 ♀; Cayuga, June (Schaus and Barnes), 1 ♂, 1 ♀; Purulha, July (Schaus and Barnes), 2 ♀; Chejel, June (Schaus and Barnes), 3 ♀; San Geronimo (Champion), 1 ♂ paratype; no further data (Rodriguez), 1 ♂.

MEXICO: Coatepec, [Veracruz], 3 ♂, 3 ♀; Jalapa, [Veracruz], 3 ♂, 9 ♀, (Hoege), 1 ♀ paratype; Cordoba, [Veracruz], May, 1 ♀, Dec. (Fredk. Knab), 1 ♀; Orizaba, [Veracruz], Nov., 1 ♀ (R. Muller), 2 ♀, Apr. (C. C. Hoffmann), 1 ♀; Carrillo, [Oaxaca], 3 ♂, 1 ♀; Tejuatlan, Puebla, May (Dawson), 1 ♀; no further data, 1 ♀.

Melanolophia flexilinea flexilinea (W. Warren)

MEXICO: Jalapa, [Veracruz], 4 ♂, 3 ♀ (including type of *flexilinea*) (W. Schaus), 10 ♂, 18 ♀, Aug., 1 ♂, (M. Trujillo), 5 ♂, 3 ♀; Orizaba, Veracruz, 1 ♂, 2 ♀, Nov. (R. Muller), 1 ♀ (C. C. Hoffmann), 1 ♀, Mar., Apr. (W. Schaus), 2 ♂, 2 ♀; Veracruz, 1 ♀; San Angel, D. F., June, Aug. (C. C. Hoffmann), 1 ♂, 1 ♀; Cerro Pelon, Municipio Yolox, Oaxaca, Sept., 7052 ft. (E. C. Wel-ling), 1 ♀.

HONDURAS: No further data, 1 ♂.

Melanolophia flexilinea digna Prout

COLOMBIA: Torné, Aug., 1 ♂ paratype; San An-

tonio, [Valle del Cauca], June, 1700–2000 meters (Fassl), 5 ♂; Alto de Las Cruces, [Norte de Santander], June, 2000 meters (Fassl), 1 ♂; Cañon del Tolima, [Tolima], Oct., 1700 meters (Fassl), 1 ♂; no further data, 2 ♂.

GROUP VI

Melanolophia orthotis Prout

BRAZIL: Chapada, near Cuyabá, Mato Grosso, 1 ♂; Burity, 30 miles northeast of Cuyabá, Mato Grosso, Sept., Oct., 2250 ft. (C. L. Collenette), 6 ♂.

BOLIVIA: Chapare and Region Chapare, [Beni], Apr., May, June, July, Aug., Nov., 400 meters (Peña), 10 ♂, 2 ♀.

PERU: La Union, R[i]o Huacamayo, Carabaya, [Puno], Nov. (wet season), 2000 ft. (G. Ockenden), 2 ♂.

COLOMBIA: Medina, [Boyaca], 500 meters (Fassl), 1 ♂.

Melanolophia divergens (W. Warren)

FRENCH GUIANA: St. Laurent du Maroni, Nov., 2 ♂ (including type of *divergens*).

Melanolophia intervallata (W. Warren)

COSTA RICA: Juan Vinas, 1 ♂, 1 ♀ (including type of *directilinea*); Carillo, Mar. (W. Schaus), 1 ♂; Tuis, Aug., 1 ♀.

PANAMA: El Volcan, Chiriqui, Feb. (Gertsch and Lutz), 1 ♂.

ECUADOR: Paramba, [Imbabura], "Jan. to May," 1 ♂, 1 ♀.

PERU: Pozuzu, [Huánuco], 1 ♂; Santo Domingo, Carabaya, [Puno], Nov. (wet season), 6000 ft. (Ockenden), 2 ♀.

BRAZIL: Jaragua do Sul, Santa Catarina, Aug. (F. Hoffmann), 1 ♀; hills between Hansa and Jaragua, Santa Catarina, Mar., 400 meters (A. Maller), 1 ♂.

Melanolophia reducta reducta (W. Warren)

PERU: Cerro de Pasco, Huancabamba, 6000–10,000 ft. (E. Boettger), 19 ♂; Huancabamba, [Piura], 6000–10,000 ft., 18 ♂ (Boettger), 2 ♂, 5000–6400 ft., 1 ♂; Oxapampa, [Pasco], 6400 ft., 3 ♂, 2000 meters, 10 ♂; San Remon, June–Aug., 3000 ft. (Watkins and Tomlinson), 1 ♂; R[i]o Colorado, Oct. (Watkins), 1 ♂.

ECUADOR: "Environs de Loja," [Loja], 2 ♂.

Melanolophia corza (Dognin)

ECUADOR: "Environs de Loja," [Loja], 1 ♀ (type of *corza*).

BOLIVIA: Region Chapare, [Beni], Sept., 400 meters, 1 ♀.

Melanolophia madefactaria (Dyar)

DOMINICA: No further data, June–July (H. W.

Foote, Yale Expedition, 1915), 1 ♀ (type of *madefactaria*).

Melanolophia argilaria (Guenée)

COLOMBIA: 2 ♂ (including lectotype of *argilaria*).

Melanolophia commotaria (Maassen)

ECUADOR: Between Baños, [Tungurahua] and Jívaria del Píntuc, [Napo–Pastaza], 900–1500 meters, 1 ♂ (type of *commotaria*); Baños, Rio Pastaza, [Tungurahua], 5000–7000 ft. (M. G. Palmer), 1 ♂, 2 ♀; "Environs de Loja," [Loja], 7 ♂; Loja, [Loja], 1 ♂.

COLOMBIA: San Antonio, [Valle del Cauca], Nov., Dec., 5800 ft. (M. G. Palmer), 2 ♂, Aug., Oct., Mar., 2000 meters (Fassl), 3 ♂; Cañon del Tolima, [Tolima], Mar., 1700 meters (A. H. Fassl), 1 ♂; Villa Elina, Aug., 1800 meters (Fassl), 1 ♀.

VENEZUELA: No further data, 1 ♂.

Melanolophia dislocata (W. Warren)

PERU: Oxapampa, [Pasco], 6400 ft., 8 ♂, 2000 meters, 3 ♂; Huancabamba, [Piura], 6000–10,000 ft. (Boettger), 8 ♂; Cerro de Pasco, Huancabamba, 6000–10,000 ft. (Boettger), 8 ♂; Rio Huacamayo, Carabaya, [Puno], June, 3100 ft. (G. Ockenden), 2 ♂; Pozuzu, [Huánuco], 5000–6000 ft. (native collectors), 3 ♂; Cushi, Huánuco, 1900 meters (W. Hoffmanns), 2 ♂; Chachapoyas, Amazonas (M. de Mathan), 1 ♂; Huallaga, [San Martin], 3 ♂; no further data (Collins), 2 ♂.

Melanolophia mutabilis (W. Warren)

JAMAICA: Near Troy, May, 1 ♂; Up Park, 1 ♀; Newcastle, 1 ♀; no further data, 2 ♂, 6 ♀.

BRITISH GUIANA: No further data, 1 ♂, 1 ♀.

"S. AMERICA": 1 ♂ (paratype of *fasciata*).

GROUP VII

Melanolophia spatiosata (Dognin)

BOLIVIA: Chapare, [Beni], Apr., June, July, Aug., Dec., 400 meters (Peña), 16 ♂; Yungas del Palmar, Apr., 2000 meters, 1 ♂; San Ernesto, Mapiri, [La Paz], (dry season), 1000 meters, 3 ♂, Aug.–Sept. (Simons), 7 ♂; Rio Songo, 750 meters (Fassl), 4 ♂; Corvico, 1800 meters, 4 ♂; Yungas la Paz, 1 ♂; Yunga del Espíritu Santo, Cochabamba (P. Germain), 2 ♂ (including type of *spatiosata*); no further data, 1 ♂.

PERU: Callanga, Paucartambo, Cuzco, Feb. (F. L. Woytkowski), 1 ♂; Chaquimayo, [Puno], "6–7," Sept., 2500–3000 ft. (H. and C. Watkins), 3 ♂; Onaca, Santa Marta, June–Aug., 2000 ft. (C. Engelke), 2 ♂; V[olcan] de Andreis, Makasaka, Santa Marta, 1 ♀; Tinguri, Carabaya, [Puno], Jan. (wet season), Aug. (dry season), 3400 ft. (G. Ockenden), 2 ♂, 1 ♀; La Oroya, Carabaya,

[Puno], Sept., 3100 ft. (G. R. Ockenden), 1 ♂; La Oroya, R[io] Inambari, [Puno], Mar. (wet season), Sept. (dry season), 3100 ft. (G. Ockenden), 4 ♂, 1 ♀; Santo Domingo, Carabaya, [Puno], Oct. (dry season), Nov., Dec. (wet season), 6000–6500 ft. (G. Ockenden), 2 ♂, 3 ♀; Chanchamayo, [Pasco] (Schuncke), 2 ♂; Huancabamba, Junin, Feb., 3000 ft. (Boettger), 1 ♂; Oxapampa, [Pasco], 2000 meters, 1 ♂.

Melanolophia eucheria Schaus

BRAZIL: Tijuco, [Minas Gerais], 1 ♂; Alto da Serra, São Paulo, Feb. (Pohl), Dec. (R. Spitz), 1 ♂, 1 ♀ (including type of *eucheria*); Alto da Serra, Santos, [São Paulo], Mar., Dec., 800 meters (E. D. Jones), 2 ♂; Serro do Cubotas, São Paulo, Aug. (F. Wucherpfennig), 1 ♂, 1 ♀; Salesopolis, [São Paulo], 1 ♀; Organ Mts., near Tijuca, Rio de Janeiro (S. R. Wagner), 1 ♂; Paraná, 1 ♂; Rio Laeiss, Blumenau, Santa Catarina, Dec. (F. H. Hoffman), 1 ♂, 1 ♀; Jaragua do Sul, Santa Catarina, Aug., Sept. (Hoffmann), 2 ♂, 1 ♀; Hansa Humboldt, Santa Catarina, July, 60 meters (A. Maller), 1 ♂; Nova Bremen, Santa Catarina, Sept., 250 meters (F. Hoffman), 1 ♀; no further data, 1 ♂.

Melanolophia consimiliaria (Walker)

BRAZIL: Espírito Santo, 1 ♂; Minas Gerais, "11" (J. F. Zikan), 1 ♂; São Paulo, 750 meters (E. D. Jones), 1 ♀; Campo Bello, Rio [de Janeiro] (Zikan), 1 ♂; Rio [de] Janeiro, 1 ♀; Petropolis, [Rio de Janeiro], 1 ♂, 1 ♀ (including type of *nebularia*); Castro, Paraná, 4 ♂; Nuevo Teutonia, [Santa Catarina], Jan., Apr., May, July, Aug., Dec., 300–500 meters (F. Plaumann), 9 ♂, 2 ♀; Rio Vermelho, Santa Catarina, Mar., Apr., May, 850 meters (F. Hoffman, A. Maller), 4 ♂; Rio Laeiss, Neu Bremen, Santa Catarina, June (F. Hoffmann), 1 ♂; Nova Bremen, Santa Catarina, Apr., 250 meters (F. Hoffman), 1 ♂; Rio Laeiss, Blumenau, Santa Catarina, Oct. (F. H. Hoffman), 1 ♀; Blumenau, Santa Catarina, Feb. (F. Schade), 1 ♂; Hansa Humboldt, Santa Catarina, July, 60 meters (A. Maller), 1 ♂; Jaragua do Sul, Santa Catarina, June (Hoffmann), 1 ♀; Rio Grande do Sul, May, 2 ♂, 1 ♀; Rio (Derg.), 1 ♂, 1 ♀; Santa Cruz, "Bresil meridionale," 1 ♂.

Melanolophia immarcata (Schaus)

PERU: No further data, 1 ♂ (type of *immarcata*).

BOLIVIA: Yunga del Espíritu Santo, Cochabamba (P. Germain), 1 ♂.

Melanolophia agnataria (Snellen)

COLOMBIA: "Ob. Rio Negro," [Norte de Santander], 800 meters (Fassl), 6 ♂, 2 ♀; Onaca, Santa Marta, [Magdalena] (Engelke), 1 ♂; Bo-

gota, [Cundinamarca] (Birchell), 2 ♂; Bogota to Coachi, Jan. (dry season), 1700 meters (Dr. Burger), 1 ♂; Cananche, Cundinamarca (M. de Mathan), 1 ♂; San Cajetano, Sept., 8000 feet, 1 ♂; Muzo, [Santander], 400–800 meters (Fassl), 1 ♂; Las Partidas, 3000 feet (H. Smith), 1 ♀; Valparaíso, [Antioquia], Apr., 4500 feet (H. H. Smith), 1 ♀; Quindio, [Tolima], June, 1 ♂.

VENEZUELA: Merida, without date, Oct., Dec. (S. Briceno), 4 ♂, 4 ♀.

Melanolophia muscosa (W. Warren)

ECUADOR: "Environs de Loja," [Loja], 1 ♂.

PERU: Pumayaca (F. Johnson), 1 ♂.

GENUS *PHEROTESIA* SCHAUS

GROUP I

Pherotesia condensaria (Guenée)

BRAZIL: Campo de Muero, Minas Gerais, Feb., 1900 meters (J. F. Zikan), 1 ♂; Espírito Santo, 1 ♀; Rio [de] Janeiro, 1 ♂; Baracea, São Paulo, Apr. (Pearson), 1 ♂; Alto da Serra, Santos, [São Paulo], Dec., 800 meters (E. D. Jones), 1 ♂; Castro, Paraná, Nov., 950 meters (E. D. Jones), 6 ♂, 2 ♀; Nuevo Teutonia, [Santa Catarina], July, Aug., Nov., 4 ♂; Santa Catarina, 2 ♀.

Pherotesia confusata (Walker)

BRAZIL: Serra do Mar, São Paulo, Feb. (F. Wucherpfennig), 1 ♂; Alto da Serra, São Paulo, Dec. (Pohl), 1 ♀; Prov. Rio (Zikan), 1 ♂; Petropolis, [Rio de Janeiro], 2 ♂; Lago Azul, [Parque] N[acional] Itatiaia, Rio de Janeiro, Apr., 800 meters (Pearson and Barros), 1 ♂; Santa Catarina, 1 ♂; Rio Laeiss, Blumenau, Santa Catarina, Dec. (F. H. Hoffman), 1 ♂, 1 ♀; Rio Grande do Sul, 1 ♂; no further data, 2 ♀.

ARGENTINA: Misiones, Sept., 1 ♀.

Pherotesia potens W. Warren

BOLIVIA: La Paz, 100 meters (Garlepp), 1 ♂; Yungas del Palmar, Apr., 2000 meters, 1 ♀; Incachaca, Cochabamba (J. Steinbach), 13 ♂, 14 ♀; Rio Songo, 750 meters (Fassl), 2 ♀; no further data, 2 ♂.

PERU: Yahuar Mayo, [Puno], Oct.–Nov., 1200 ft., 1 ♂ (type of *parallelaria*); La Merced, [Pasco], Aug. (Rivas), 1 ♂; Chanchamayo, [Pasco] (O. Schuncke), 1 ♂; Santo Domingo, Carabaya, [Puno], Oct. (dry season), Nov. (wet season), 6000–6500 ft. (G. Ockenden), 3 ♂, 2 ♀; Tinguri, Carabaya, [Puno], Aug. (dry season), 3400 ft., 2 ♂; La Oroya, Rio Inambari, Carabaya, [Puno], Jan. (wet season), Nov.–Dec. (wet season), 3100 ft. (G. Ockenden), 4 ♂.

COLOMBIA: "Ob. Rio Negro," [Norte de Santander], 800 meters (Fassl), 1 ♂; Valparaíso,

[Antioquia], 4500 ft. (H. H. Smith), 1 ♂; Medina, [Boyaca], 500 meters, 1 ♂.

COSTA RICA: Puntarenas, Monteverde, Dec., 4600 ft. (C. W. Palmer), 1 ♂; Orosi, 1200 meters (Fassl), 1 ♂; Juan Vinas, June (Schaus and Barnes), 2 ♂, 1 ♀; Cartago, Dec., 1 ♀; no further data, 1 ♂.

***Pherotesia liciata* Dognin**

PERU: Huancabamba, [Piura], 2 ♂ (including type of *liciata*), 6000–10,000 ft., 1 ♂; Cerro de Pasco, Huancabamba, 6000–10,000 ft. (E. Boettger), 6 ♂; Oxapampa, [Pasco], 4 ♂.

GROUP II

***Pherotesia gaviota* Dognin**

COLOMBIA: Medina, [Boyaca], 500 meters, 1 ♂.

ECUADOR: "Environs de Loja," [Loja], 3 ♂ (lectotype and two cotypes).

PERU: Coosnipata, Paucartambo, Cuzco, Nov. (W. L. Woytkowski), 1 ♂; S[anto] Domingo, Carabaya, [Puno], Jan. (wet season), Oct. (dry season), Nov., 6000–6500 ft. (G. Ockenden), 3 ♀; Moyobamba, [San Martin] (M. de Mathan), 1 ♂.

BOLIVIA: Yunga del Espíritu Santo, Cochabamba (P. Germain), 2 ♂; Incachaca, Cochabamba (J. Steinbach), 1 ♀; no further data, 1 ♂.

***Pherotesia subsimilis* Dognin**

VENEZUELA: Merida, 1 ♂, 1 ♀.

COLOMBIA: Mesopotamia, Antioquia, 5000 ft., 1 ♀; Cañon del Tolima, [Tolima], Jan., Oct., 1700 meters (A. H. Fassl), 2 ♂; San Antonio, [Valle del Cauca], Feb., Mar., Oct., Nov., Dec., 1800–2000 meters (Fassl), 5 ♂ (including lectotype and three cotypes); Alto de Las Cruces, [Norte de Santander], Mar., 2300 meters (Fassl), 2 ♂ (including one cotype); no further data, 2 ♂.

ECUADOR: No further data, 1 ♂.

PERU: Oxapampa, [Pasco], 6 ♂; El Porvenir, Mar., 900 meters, 1 ♂; Chachapoyas, Amazonas (M. de Mathan), 1 ♂; Santo Domingo, Carabaya, [Puno], 6000–6500 ft., Feb. (wet season), May (dry season), Oct. (dry season), Nov. (wet season), Dec. (wet season) (G. Ockenden), 5 ♂, 9 ♀; Cerro de Pasco, Huancabamba (E. Boettger), 4 ♂; Huancabamba, [Junin], 1 ♂.

BOLIVIA: No further data, 1 ♂.

***Pherotesia subjecta* W. Warren**

PERU: Oconeque, Carabaya, [Puno], July (dry season), 7000 ft. (G. Ockenden), 1 ♂.

BOLIVIA: Incachaca, Cochabamba (J. Steinbach), 1 ♂, 1 ♀; Chaco, 1 ♂; no further data (G. Garlepp), 1 ♂.

***Pherotesia malinaria malinaria* Schaus**

MEXICO: Jalapa, [Veracruz], 1 ♂, 2 ♀ (includ-

ing lectotype of *malinaria*); Coatepec, [Veracruz], 1 ♂; Orizaba, [Veracruz], Apr. (W. Schaus), 1 ♂; Cuesta de Misantla, [Veracruz] (M. Trujillo), 1 ♂, 1 ♀, identified as "*Tephrosia condensaria* Guenée, B.C.A. Lep. Het., Godman-Salvin coll."; Puerto Eligio, Municipio Comaltepec, Oaxaca, Sept., 2296 ft. (E. C. Welling), 1 ♀; Vista Hermosa, Municipio Comaltepec, Oaxaca, October, 4650 ft. (E. C. Welling), 2 ♀; no further data, 1 ♂.

GUATEMALA: Senahu, Vera Paz (Champion), 1 ♂, identified as "*Tephrosia condensaria* Guenée, B.C.A. Lep. Het., Godman-Salvin coll."; S[an] Geronimo (Champion), 1 ♀, identified as "*Tephrosia condensaria* Guenée, B.C.A. Lep. Het., Godman-Salvin coll."

COSTA RICA: Puntarenas, Monteverde, Feb., Oct., Dec., 4600 ft. (C. W. Palmer), 1 ♂, 2 ♀.

***Pherotesia supplanaria* (Dyar)**

MEXICO: Misantla, [Veracruz], October (R. Muller), 1 ♀ (type of *supplanaria*).

COSTA RICA: Orosi, 1200 meters (Fassl), 1 ♂.

***Pherotesia funebris* (Schaus)**

COSTA RICA: Juan Vinas, Jan., 1 ♀ (type of *funebris*).

***Pherotesia alterata* W. Warren**

COSTA RICA: Juan Vinas, June, Nov. (Schaus and Barnes), 3 ♂, 1 ♀; Tuis, June, Aug., 2400 ft. (Schaus and Barnes), 1 ♂, 1 ♀; Puntarenas, Monteverde, Jan., 4600 ft. (C. W. Palmer), 1 ♂.

PANAMA: El Volcan, Chiriqui, Feb. (Gertsch and Lutz), 1 ♂; V[olcan] de Chiriqui, [Chiriqui], 2000–3000 ft. (Champion), identified as "*Tephrosia condensaria* Guenée, B.C.A. Lep. Het., Godman-Salvin coll.," 3000–4000 ft. (Champion), 2 ♂.

MELANOTESIA, NEW GENUS

***Melanotesia siderata* (Dognin)**

BOLIVIA: Rio Songo, 750 meters (Fassl), 2 ♂ (including type of *siderata*); Incachaca, Cochabamba (J. Steinbach), 1 ♂; Yungas del Palmar, Feb., Apr., 2000 meters, 3 ♂, 1 ♀.

PERU: Santo Domingo, Carabaya, [Puno], Nov. (wet season), 6000 ft. (G. Ockenden), 1 ♂; Coosnipata, Paucartambo, Cuzco, Nov. (F. L. Woytkowski), 1 ♂.

***Melanotesia intensa* (Dognin)**

COLOMBIA: San Antonio, [Valle del Cauca], Jan., Feb., Mar., Aug., Nov., 2000 meters, 7 ♂; Alto de Las Cruces, [Norte de Santander], Jan., Oct., 2200–2300 meters (Fassl), 2 ♂; Villa Elina, Oct., 1800 meters (Fassl), 1 ♂; no further data (Fassl), 6 ♂ (including lectotype and cotype of *intensa*).

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PLATE 3

1. *Melanolophia delinquaria* (Walker), male, Nuevo Teutonia, Brazil, April, 1953 (Plaumann; A.M.N.H.).
 2. *Melanolophia modica*, new species, paratype, male, Independencia, Paraguay, September 10, 1950 (A.M.N.H.).
 3. *Melanolophia apicalis* (W. Warren), male, Nuevo Teutonia, Brazil, April, 1953 (Plaumann; A.M.N.H.).
 4. *Melanolophia vitta*, new species, holotype, male, Petropolis, Brazil (B.M.N.H.).
 5. *Melanolophia praeapicata* (W. Warren), male, Nuevo Teutonia, Brazil, May, 1953 (Plaumann; A.M.N.H.).
 6. *Melanolophia centosa* (Schaus), male, Castro, Paraná, Brazil (E. D. Jones; B.M.N.H.).
 7. *Melanolophia striata* (W. Warren), paratype, male, Huancabamba, Cerro de Pasco, Peru (E. Boettger; B.M.N.H.).
 8. *Melanolophia substriata*, new species, holotype, male, "Ob. Rio Negro, Ost Colombia" (Fassl; B.M.N.H.).
 9. *Melanolophia subatrata* (Dognin), male, Nuevo Teutonia, Brazil, November 17, 1952 (Plaumann; A.M.N.H.).
 10. *Melanolophia inatrata*, new species, paratype, male, Chapare, Bolivia, May 30, 1949 (A.M.N.H.).
 11. *Melanolophia conspicua* Schaus, male, Tuis, Costa Rica, May (Schaus and Barnes; U.S.N.M.).
 12. *Melanolophia fugitaria* Schaus, holotype, Juan Vinas, Costa Rica, May (U.S.N.M.; U.S.N.M. photograph).
 13. *Melanolophia umbrosa*, new species, holotype, male, Region Chapare, Bolivia, April, 1951 (A.M.N.H.).
 - 14, 15. *Melanolophia tenebrosa* (W. Warren). 14. Male, Tucuman, Argentina (R. Schreiter; B.M.N.H.). 15. Female, El Siambon, Tucuman, Argentina (R. Schreiter; B.M.N.H.).
 16. *Melanolophia muscitincta* (W. Warren), male, Coosnipata, Paucartambo, Cuzco, Peru, November 23, 1951 (F. L. Woytkowski; A.M.N.H.).
 17. *Melanolophia piura*, new species, holotype, male, Huancabamba, Peru (U.S.N.M.).
 18. *Melanolophia producta*, new species, holotype, male, Balzapamba, Bolivar, Ecuador, March-April, 1894 (M. de Mathan; B.M.N.H.).
- All figures natural size.

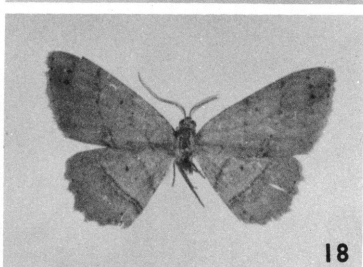
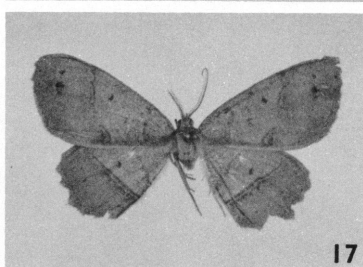
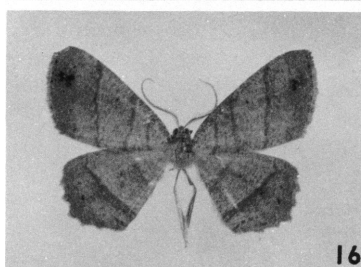
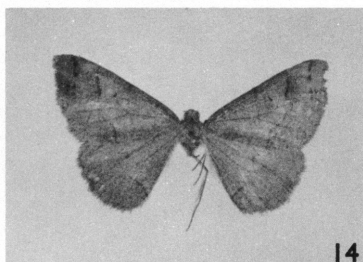
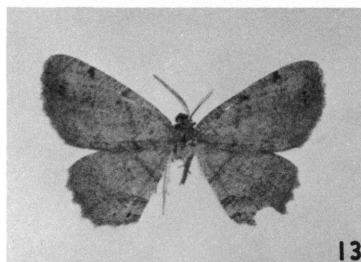
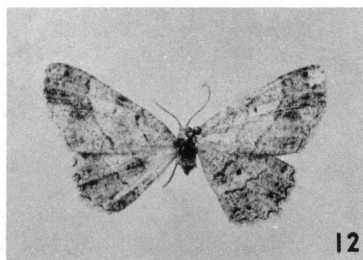
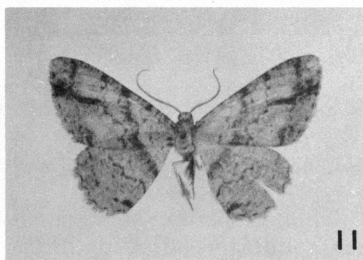
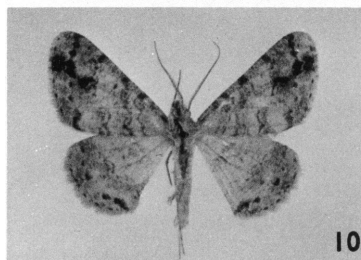
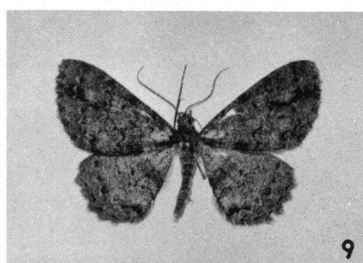
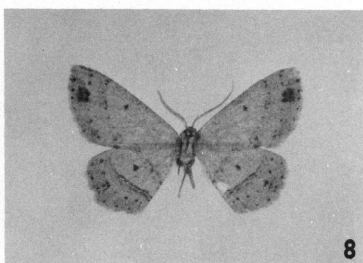
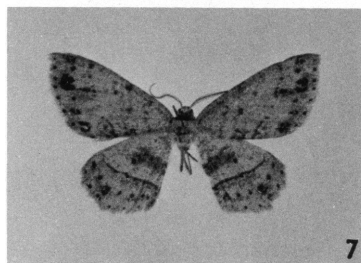
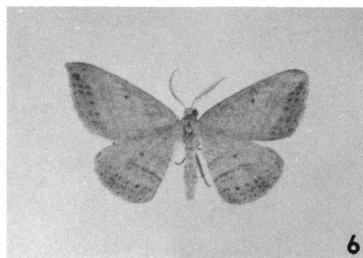
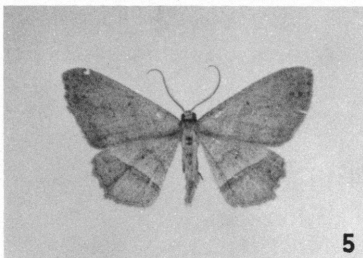
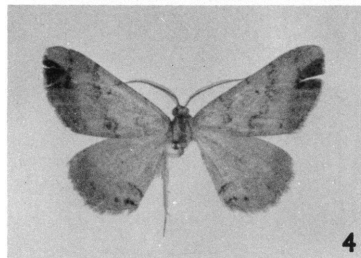
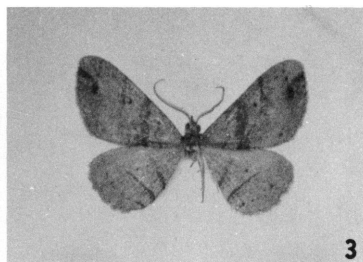
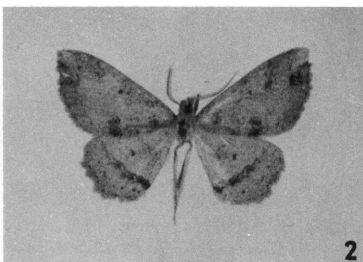
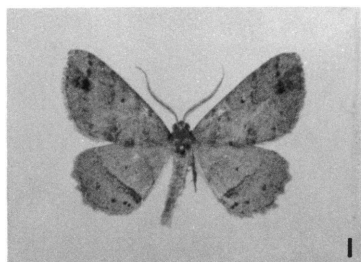


PLATE 4

1. *Melanolophia vulsa*, new species, holotype, female, Sierra del Libane, Colombia (H. H. Smith; B.M.N.H.).
2. *Melanolophia limosa* (Dognin), male, "Environs de Loja," Ecuador, 1890 (U.S.N.M.).
3. *Melanolophia accurata* Prout, male, San Antonio, Colombia, 1909 (Fassl; U.S.N.M.).
4. *Melanolophia rubrica*, new species, holotype, female, Cayuga, Guatemala, May (Schaus and Barnes; U.S.N.M.).
5. *Melanolophia eudoxa eudoxa*, new subspecies, paratype, male, Chapare, Bolivia, December 8, 1949 (Peña; A.M.N.H.).
6. *Melanolophia eudoxa simpla*, new subspecies, holotype, male, Cañon del Tolima, Colombia (Fassl; U.S.N.M.).
7. *Melanolophia trisurca trisurca* (Dognin), male, "Environs de Loja," Ecuador, 1891 (U.S.N.M.).
8. *Melanolophia trisurca elongata*, new subspecies, holotype, male, Incachaca, Cochabamba, Bolivia (J. Steinbach; U.S.N.M.).
9. *Melanolophia munda* (W. Warren), male, Cushi, Huánuco, Peru (W. Hoffmanns; B.M.N.H.).
10. *Melanolophia vegranda*, new species, holotype, male, Balzapamba, Bolivar, Ecuador, September, 1893, to February, 1894 (M. de Mathan; B.M.N.H.).
11. *Melanolophia perversa*, new species, holotype, male, Nuevo Teutonia, Brazil, May 26, 1952 (Plaumann; A.M.N.H.).
12. *Melanolophia triloba*, new species, holotype, male, Jalapa, Mexico (W. Schaus; A.M.N.H.).
13. *Melanolophia penicilla*, new species, paratype, male, Zamora, Ecuador, March, 1886 (U.S.N.M.).
14. *Melanolophia atrifascia*, new species, holotype, male, Barro Colorado, Canal Zone, March 12, 1936 (Gertsch, Lutz, Wood; A.M.N.H.).
15. *Melanolophia homofascia*, new species, holotype, male, San Esteban, Venezuela, July, 1909 (S. M. Klages; B.M.N.H.).
16. *Melanolophia sadrina sadrina* (Schaus), male, Misantla, Veracruz, Mexico (W. Gugelmann; B.M.N.H.).
17. *Melanolophia sadrina conara*, new subspecies, paratype, male, Muzo, Rio Cantinero, Colombia (A. H. Fassl; B.M.N.H.).
18. *Melanolophia sadrinaria*, new species, holotype, male, San José, Costa Rica (U.S.N.M.).

All figures natural size.

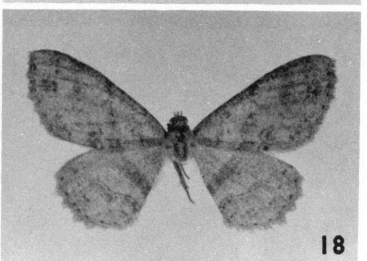
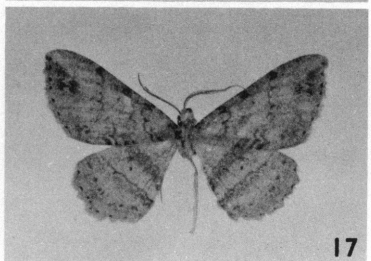
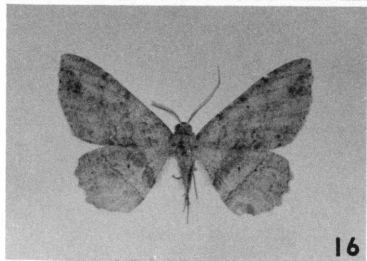
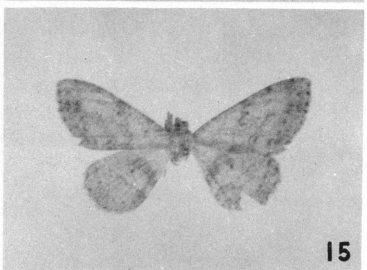
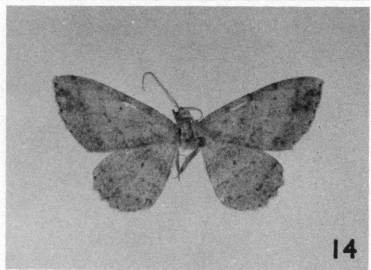
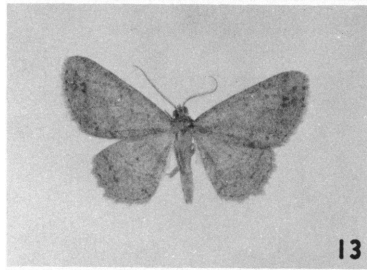
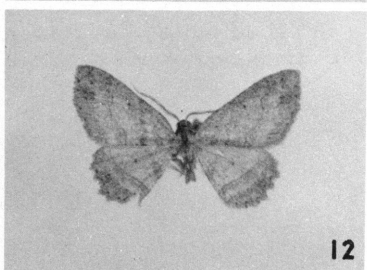
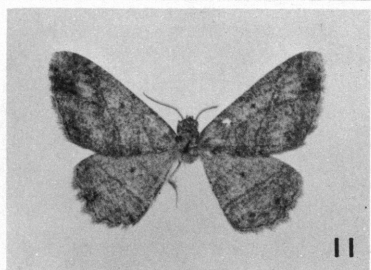
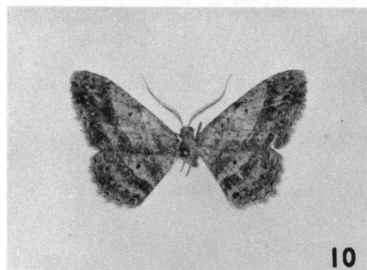
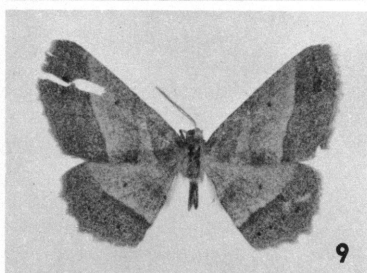
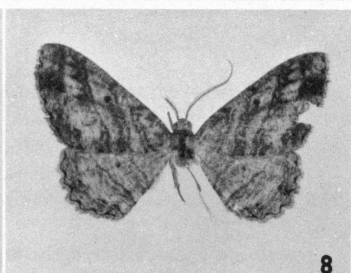
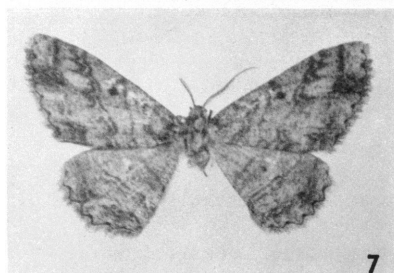
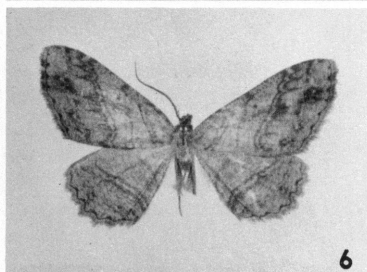
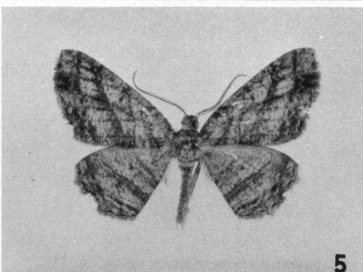
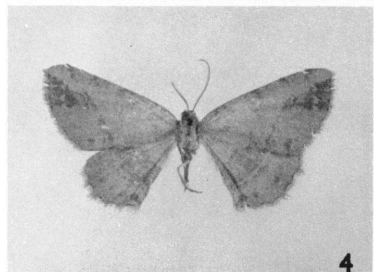
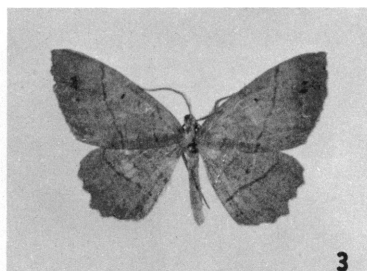
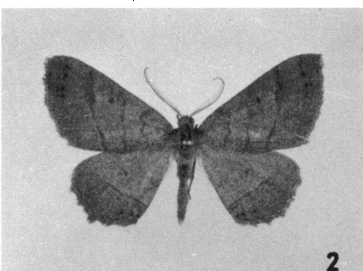
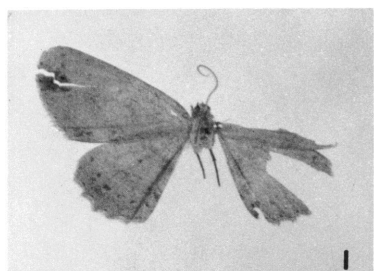


PLATE 5

1. *Melanolophia imitata imitata* (Walker), male, Wellington, British Columbia, May 11, 1950 (R. Guppy; A.M.N.H.).
2. *Melanolophia imitata barbara* McDunnough, male, El Cielo Drive, Santa Barbara County, California, July 3, 1940 (C. W. Kirkwood; A.M.N.H.).
3. *Melanolophia imitata cana*, new subspecies, holotype, male, upper Santa Ana River, San Bernardino County, California, May 19, 1949 (G. H. and J. L. Sperry; A.M.N.H.).
4. *Melanolophia centralis* McDunnough, male, Redington, Arizona (A.M.N.H.).
5. *Melanolophia bostar* (Druce), male, Jalapa, Mexico (W. Schaus; A.M.N.H.).
6. *Melanolophia flexilinea flexilinea* (W. Warren), male, Jalapa, Mexico (W. Schaus; A.M.N.H.).
7. *Melanolophia flexilinea fragosa*, new subspecies, holotype, male, Puntarenas, Monteverde, Costa Rica, February 23, 1962 (C. W. Palmer; A.M.N.H.).
8. *Melanolophia flexilinea digna* Prout, male, San Antonio, Colombia, June, 1909 (Fassl; U.S.N.M.).
9. *Melanolophia canadaria canadaria* (Guenée), male, Armdale, Nova Scotia, June 4, 1947 (D. C. Ferguson; A.M.N.H.).
10. *Melanolophia canadaria crama*, new subspecies, holotype, male, Lyons Farms, New Jersey, April 26 (Frederick Lemmer; A.M.N.H.).
11. *Melanolophia canadaria choctawae*, new subspecies, holotype, male, Clinton, Hinds County, Mississippi, February 13, 1959 (B. Mather; A.M.N.H.).
12. *Melanolophia signataria signataria* (Walker), male, New Canaan, Fairfield County, Connecticut, April 30, 1960 (M. Statham; A.M.N.H.).
13. *Melanolophia signataria timucuae*, new subspecies, holotype, male, Pensacola, Florida, February, 1961 (S. Hills; A.M.N.H.).
14. *Melanolophia imperfectaria imperfectaria* (Walker), male, Brownsville, Texas, March 8 (A.M.N.H.).
15. *Melanolophia imperfectaria solida*, new subspecies, holotype, male, Guadalajara, Mexico (U.S.N.M.).
16. *Melanolophia fimbriata*, new species, holotype, male, El Volcan, Chiriqui, Panama, February 17, 1936 (Lutz and Gertsch; A.M.N.H.).
17. *Melanolophia parma*, new species, holotype, male, Tuis, Costa Rica, June, 1907 (U.S.N.M.).
18. *Melanolophia orthotis* Prout, male, Chapare, Bolivia, November 8, 1948 (A.M.N.H.).

All figures natural size.

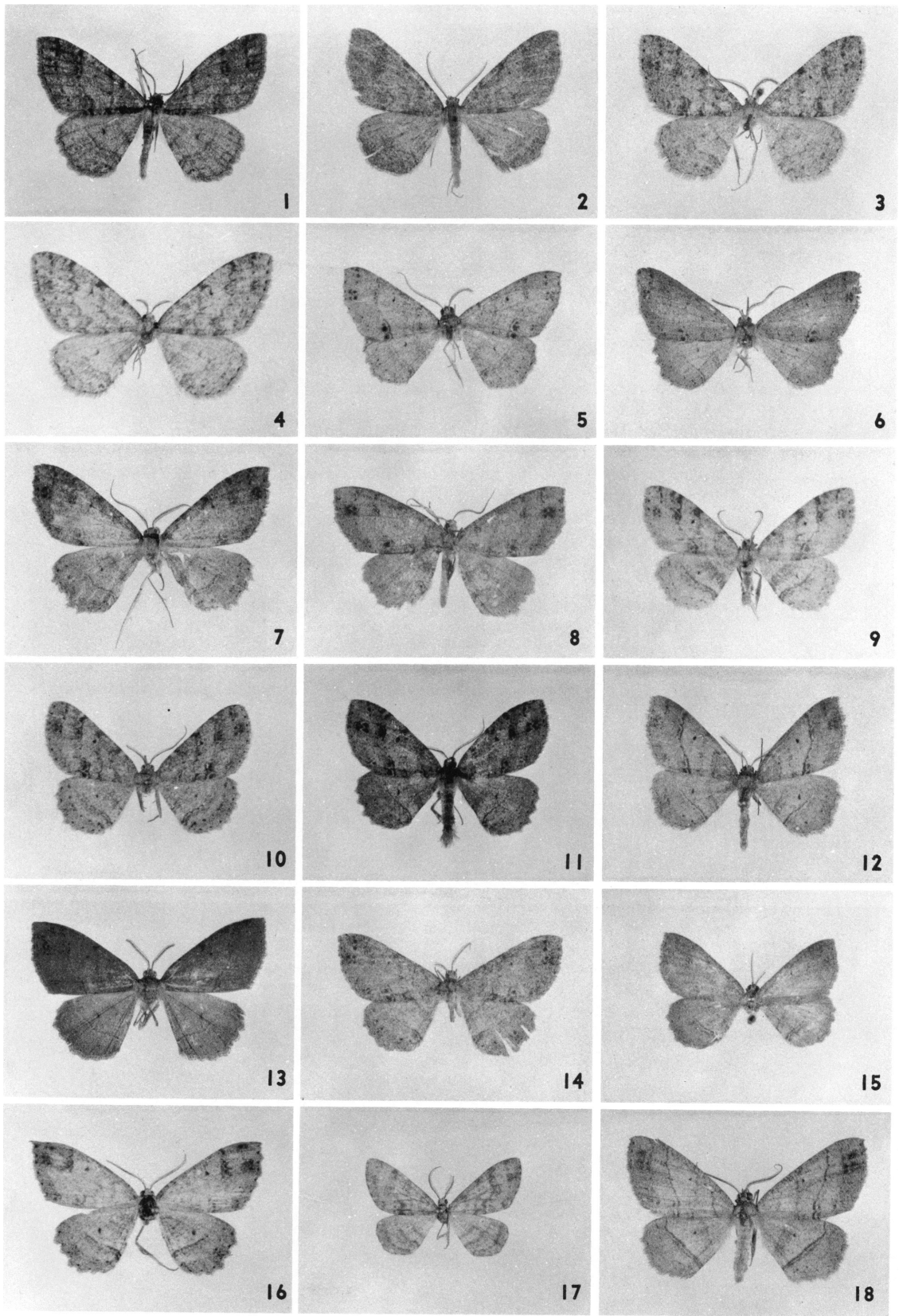


PLATE 6

1. *Melanolophia divergens* (W. Warren), male, St. Laurent du Maroni, French Guiana (U.S.N.M.).
 2. *Melanolophia intervallata* (W. Warren), male, El Volcan, Chiriqui, Panama, February 18, 1936 (Lutz and Gertsch; A.M.N.H.).
 3. *Melanolophia pseudovallata*, new species, holotype, male, Chapare, Bolivia, August 28, 1949 (Peña; A.M.N.H.).
 4. *Melanolophia reducta reducta* (W. Warren), male, Huancabamba, Cerro de Pasco, Peru (E. Boettger; B.M.N.H.).
 5. *Melanolophia reducta meridiana*, new subspecies, holotype, male, Oconeque, Carabaya, Peru, July, 1904 (G. Ockenden; B.M.N.H.).
 6. *Melanolophia reducta borea*, new subspecies, holotype, male, Cañon del Tolima, Colombia, December, 1909 (A. H. Fassl; B.M.N.H.).
 7. *Melanolophia corza* (Dognin), female, Region Chapare, Bolivia, September 25, 1949 (A.M.N.H.).
 8. *Melanolophia madefactaria* (Dyar), holotype, Dominica, June–July, 1913 (H. W. Foote; U.S.N.M.; U.S.N.M. photograph).
 9. *Melanolophia reductaria*, new species, holotype, male, Agualani, Carabaya, Peru, December, 1905 (G. R. Ockenden; B.M.N.H.).
 10. *Melanolophia dextera*, new species, holotype, male, Sierra del Libane, Colombia (H. H. Smith; B.M.N.H.).
 11. *Melanolophia isoforma*, new species, holotype, male, Monte Tolima, Colombia, February, 1910 (A. H. Fassl; B.M.N.H.).
 12. *Melanolophia isometra*, new species, holotype, male, "Environs de Loja," Ecuador, 1891 (U.S.N.M.).
 13. *Melanolophia attenuata*, new species, holotype, male, Mount Poas, Costa Rica, May (U.S.N.M.).
 14. *Melanolophia argilaria* (Guenée), lectotype, male, Colombia (B.M.N.H.).
 15. *Melanolophia synargilaria*, new species, holotype, male, Chachapoyas, Amazonas, Peru, 1889 (M. de Mathan; B.M.N.H.).
 16. *Melanolophia commotaria* (Maassen), male, "Environs de Loja," Ecuador, 1893 (B.M.N.H.).
 17. *Melanolophia dislocata* (W. Warren), male, Huancabamba, Cerro de Pasco, Peru (E. Boettger; B.M.N.H.).
 18. *Melanolophia mutabilis* (W. Warren), male, Jamaica (B.M.N.H.).
- All figures natural size.

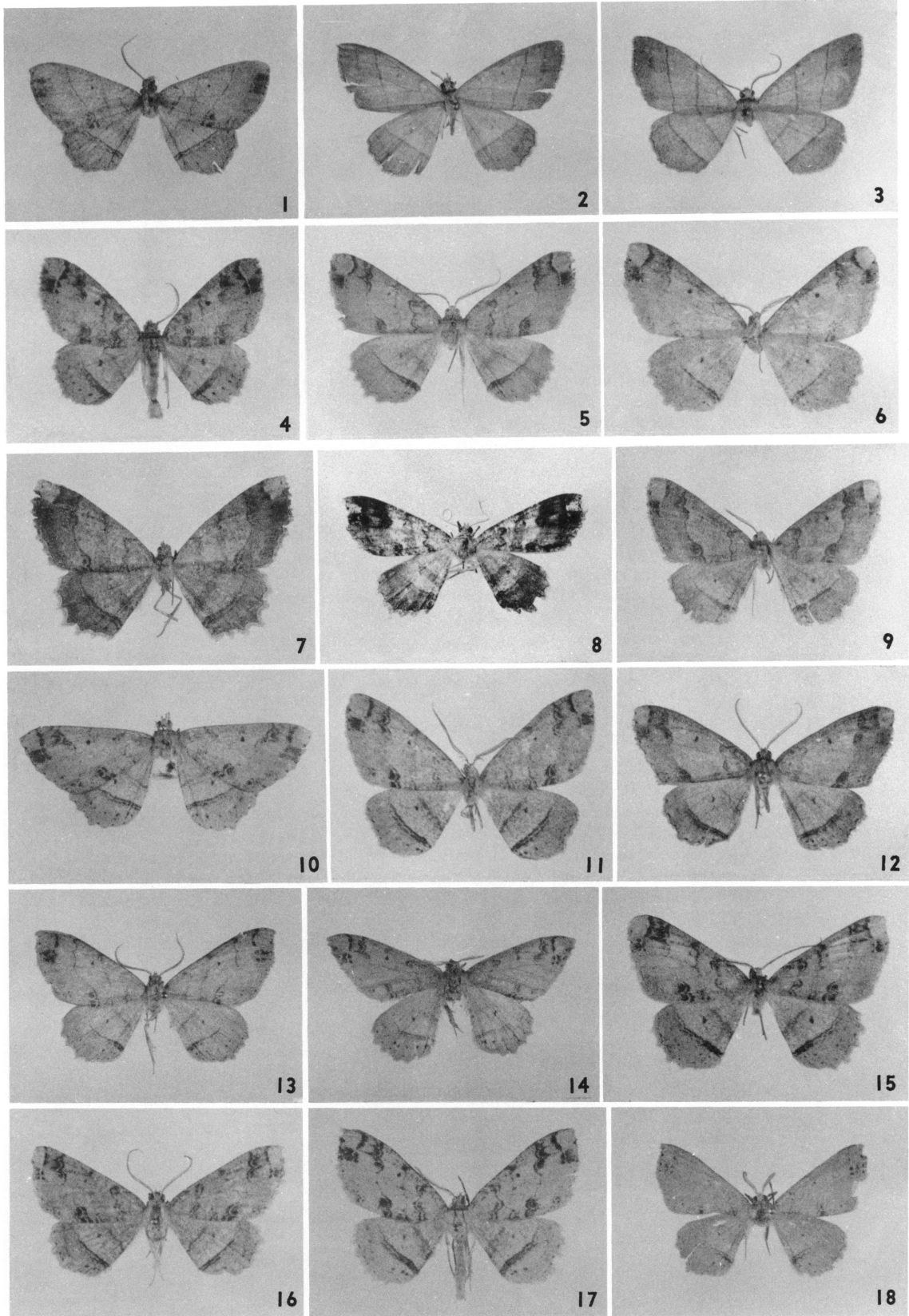


PLATE 7

1. *Melanolophia mutabilis* ab. *fasciata* (W. Warren), paratype, male, "S. America" (B.M.N.H.).
2. *Melanolophia venatia*, new species, holotype, female, Rio Songo, Bolivia (Fassl; U.S.N.M.).
3. *Melanolophia elegia*, new species, allotype, female, Puerto Elegio, Oaxaca, Mexico, September 26, 1961 (E. C. Welling; A.M.N.H.).
4. *Melanolophia mallea*, new species, holotype, male, Chanchamayo, Peru (Schuncke; B.M.N.H.).
5. *Melanolophia bugnathos bugnathos*, new subspecies, holotype, Yungas del Palmar, Bolivia, April 10, 1950 (A.M.N.H.).
6. *Melanolophia bugnathos contracta*, new subspecies, holotype, male, Balzapamba, Bolivar, Ecuador, September, 1893, to February, 1894 (M. de Mathan; B.M.N.H.).
7. *Melanolophia bugnathos elaphra*, new subspecies, holotype, female, El Volcan, Chiriqui, Panama, February 17, 1936 (Gertsch and Lutz; A.M.N.H.).
8. *Melanolophia spatiosata* (Dognin), male, Yungas del Palmar, Bolivia, April 10, 1950 (A.M.N.H.).
9. *Melanolophia conta*, new species, holotype, male, Chanchamayo, Peru (O. Schuncke; B.M.N.H.).
10. *Melanolophia minca*, new species, holotype, male, Minca, Colombia (H. H. Smith; B.M.N.H.).
11. *Melanolophia rima*, new species, holotype, male, Muzo, Colombia, May, 1915 (U.S.N.M.).
12. *Melanolophia eucheria* Schaus, male, Alto da Serra, Santos, Brazil, December, 1912 (E. D. Jones; B.M.N.H.).
13. *Melanolophia consimilaria* (Walker), male, Nuevo Teutonia, Brazil, May, 1953 (Plaumann; A.M.N.H.).
14. *Melanolophia immarcata* (Schaus), male, Yunga del Espiritu Santo, Cochabamba, Bolivia, 1888-1889 (P. Germain; B.M.N.H.).
15. *Melanolophia semarcata*, new species, holotype, male, La Merced, Peru, September 9, 1951 (Rivas; A.M.N.H.).
16. *Melanolophia agnataria* (Snellen), "Ob. Rio Negro, Ost Colombia" (Fassl; B.M.N.H.).
17. *Melanolophia muscosa* (W. Warren), male, "Environs de Loja," Ecuador, 1891 (U.S.N.M.).

All figures natural size.

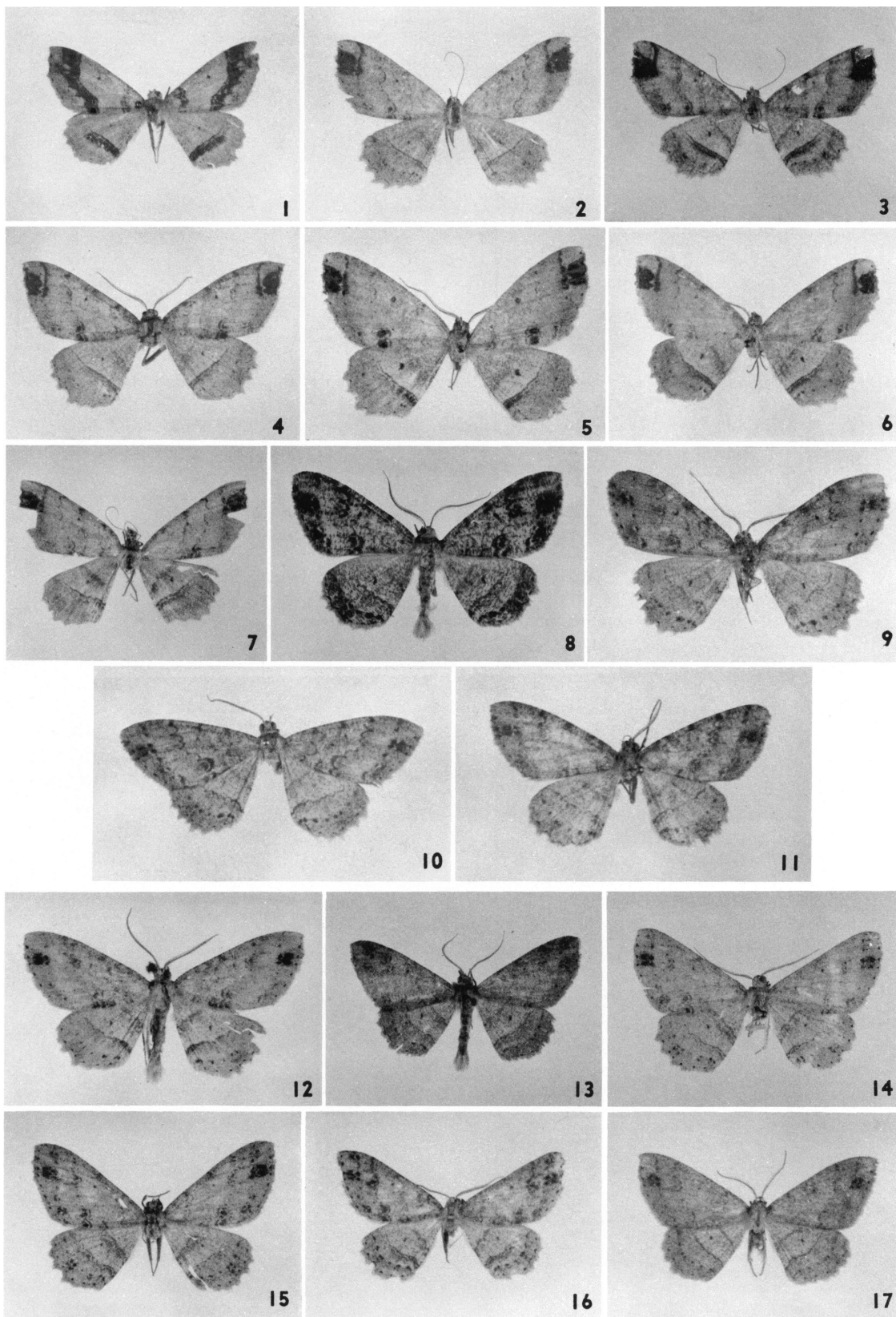


PLATE 8

1. *Melanolophia paraconara*, new species, holotype, male, Popayan, Colombia (Lehmann; B.M.N.H.).
2. *Melanolophia orthoconara*, new species, holotype, male, Lino, Panama (Fassl; U.S.N.M.).
3. *Pherotesia condensaria* (Guenée), male, Nuevo Teutonia, Brazil, November 19, 1952 (Plaumann; A.M.N.H.).
4. *Pherotesia confusata* (Walker), male, Petropolis, Brazil (B.M.N.H.).
5. *Pherotesia simulatrix*, new species, holotype, male, Yuntas, near Cali, Colombia (U.S.N.M.).
6. *Pherotesia potens* W. Warren, male, La Oroya, Rio Inambari, Peru, January, 1906 (Ockenden; B.M.N.H.).
7. *Pherotesia liciata* Dognin, male, Huancabamba, Cerro de Pasco, Peru (Boettger; B.M.N.H.).
8. *Pherotesia gaviota* (Dognin), male, Coosnipata, Paucartambo, Cuzco, Peru, November 20, 1951 (F. L. Woytkowski; A.M.N.H.).
9. *Pherotesia lima*, new species, holotype, male, "Intaj," Ecuador (Buckley; B.M.N.H.).
10. *Pherotesia subsimilis* (Dognin), male, Colombia (Fassl; U.S.N.M.).
11. *Pherotesia ulirasimilis*, new species, holotype, male, Coosnipata, Paucartambo, Cuzco, Peru, November 20, 1951 (F. L. Woytkowski; A.M.N.H.).
12. *Pherotesia lunata*, new species, holotype, male, Sierra del Libane, Colombia (H. H. Smith; B.M.N.H.).
13. *Pherotesia subjecta* W. Warren, male, Incachaca, Bolivia (J. Steinbach; U.S.N.M.).
14. *Pherotesia malinaria malinaria* Schaus, male, Coatepec, Mexico (U.S.N.M.).
15. *Pherotesia malinaria minuisca*, new subspecies, holotype, male, Volcan de Chiriqui, Panama, May-June, 1898 (M. de Mathan; B.M.N.H.).

All figures natural size.

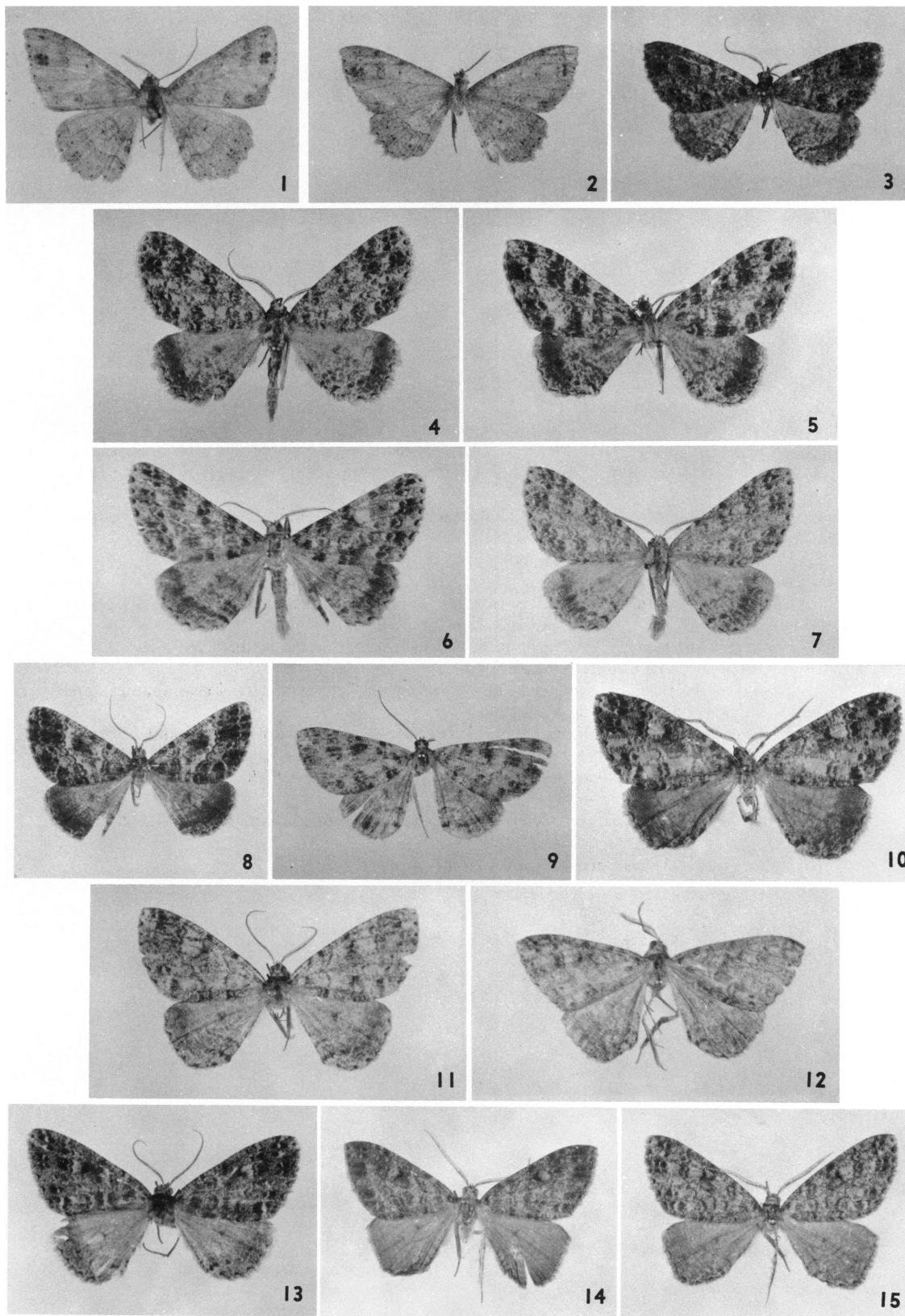


PLATE 9

- 1, 2. *Pherotesia supplanaria* (Dyar). 1. Male, Orosi, Costa Rica (Fassl; B.M.N.H.).
2. Holotype, female, Misantla, Mexico, October, 1911 (R. Muller; U.S.N.M.; U.S.N.M. photograph).
3. *Pherotesia falcis*, new species, holotype, male, Popocatepetl Park, Mexico, July, 1906 (U.S.N.M.).
4. *Pherotesia hamata*, new species, holotype, male, Mo Cuou, Oaxaca, Mexico, September 17, 1962 (E. C. Welling; A.M.N.H.).
5. *Pherotesia funebris* (Schaus), holotype, female, Juan Vinas, Costa Rica, January (U.S.N.M.; U.S.N.M. photograph).
6. *Pherotesia caeca*, new species, paratype, male, Cerro Pelon, Oaxaca, Mexico, September 13, 1961 (E. C. Welling; A.M.N.H.).
7. *Pherotesia alterata* W. Warren, male, Puntarenas, Monteverde, Costa Rica, January 20, 1961 (C. W. Palmer; A.M.N.H.).
8. *Pherotesia bifurca*, new species, holotype, male, Volcan Santa Maria, Guatemala, June (Schaus and Barnes; U.S.N.M.).
9. *Melanotesia siderata* (Dognin), male, Incachaca, Cochabamba, Bolivia (J. Steinbach; U.S.N.M.).
10. *Melanotesia intensa* (Dognin), male, Alto de Las Cruces, Colombia, February 10, 1908 (Fassl; U.S.N.M.).
11. Male genitalia of *Melanolophia olivescens* (W. Warren), holotype (B.M.N.H. photograph).

All figures natural size except for 11.

